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Indigenous knowledge and its implication for agricultural development and agricultural education: a case study of the Vedic tradition in Nepal

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Willett, Anthony B. J., Ph.D.

Iowa State University, 1993

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**Indigenous knowledge and its implication for agricultural development and
agricultural education: A case study of the Vedic tradition in Nepal**

by

Anthony B. J. Willett

**A Dissertation Submitted to the
Graduate faculty in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY**

**Department: Agricultural Education and Studies
Major: Agricultural Education**

Approved:

Signature was redacted for privacy.

In Charge of Major Work

Signature was redacted for privacy.

For the Major Department

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For the Graduate College

**Iowa State University
Ames, Iowa**

1993

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DEDICATION

In memory of:

Kaviraj Narapati Pokhrel

Bernard Ernest Willett

Barbara Mary Willett

Dedicated to:

Samyog and Shristi

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CHAPTER 1. INTRODUCTION

There is a strong current of opinion that development guided only by the modern scientific paradigm is accompanied by, and moreover *causes*, underdevelopment and the growth of ignorance (111). Consequences of underdevelopment have been variously described as an outrage (53) and a history of pain (28). There is a very cruel "other side of history" (197) of human rights and other abuse experienced by millions of "victims of progress" (40). The process of modern development, particularly of agriculture, leaves in its wake tragic destruction of environments, biodiversity, peoples, languages, cultures, and traditional knowledge. Its sustainability, and the health and quality of all life it achieves, is questionable on many levels -- moral and spiritual as well as psychological, social, and economic.

Since the mid 1970s, there has been a resurgence of interest in *indigenous knowledge* which spans a diversity of perspectives, including those of scientists, development agents and facilitators, conservationists, political advocates of indigenous rights, and capitalist interests (161).

The diversity of this arena of interests raises two questions: Who defines what indigenous knowledge is, and who then controls its exploitation? At a recent international symposium (161) on indigenous knowledge and sustainable development, participants found it difficult to agree on a common understanding of indigenous knowledge and "decided that it was easier to define what does *not* fall under this category and agreed on the following working definition..."

The term "indigenous knowledge" (IK) is used synonymously with "traditional" and "local knowledge" to differentiate the knowledge developed by a given community from the international knowledge system, sometimes also called the "Western" system, generated through universities, government research centers and private industry. IK refers to the knowledge of indigenous peoples as well as any other defined community (p.3).

While this definition is valuable in conceptualizing IK as distinct from "Western" knowledge, it clearly falls short in terms of identifying and defining positively what IK *is*. In other words, being defined in terms of what it is *not* may maintain a tendency for

IK to be understood through the compartments and lenses of Western academic disciplines and interests. As Hobart wrote (p.1), "not only are indigenous knowledges ignored or dismissed, but the nature of the problem of underdevelopment and its solution are defined by reference to this world-ordering [western scientific] knowledge" (111).

The use of indigenous knowledge involves a war of world views. This is captured by Kibben and Bartz (137) when they write:

...in an era when pivotal policy decisions are being made on the management of tropical forests, there are heated arguments over cattle ranching versus subsistence farming, the pros and cons of pesticides and herbicides, and the efficiency of reforestation. Chemical manufacturers, logging companies, and beef industry representatives compete for the attention of policy makers... but some feel voices [of indigenous people] which have the most to say are not heard.

The war is between those educated and enculturated in (or acculturated into) Western rationality and values who hold the dominant understanding of development, and "other" subordinated cultures with different world views about the origin, nature, and purpose of humankind. As indigenous knowledge is popularized, the issue is whether a transforming, humanizing, dialectical process of dialogue can overcome the dichotomies and dualities of development (82).

Although studies of IK provide evidence that IK is important and powerful, a related question is whether the exploitation of IK can occur in any profound and enduring sense without the revival of parent cosmologies of which it is the expression. In this regard, Warren (282) has noted that "what has not yet been done is to capture the essence of the ethno-epistemological system" underpinning indigenous knowledge, and what this essence implies for the role of IK versus western scientific knowledge and for synthesis between the two knowledge systems. This is a quest for a philosophical framework for, and definition of, indigenous knowledge (134).

Nowhere is such a quest more relevant than in the context of Nepal. This is a society that maintains intact one of the world's most ancient knowledge systems -- the Vedic tradition -- a highly articulated system of philosophy and science at least six millennia old. However, the custodians of this culture seem threatened by the influence of modern, Western development in Nepal which, despite plentiful foreign aid for

agriculture over the past three decades, has totally failed to maintain food security and adequate nutritional levels for the majority of Nepalis.

The modern, scientific study of indigenous knowledge systems was made possible by methodological developments in linguistic anthropology in the early 1970s (275). Prior to that period, for reasons to be discussed more fully in Chapters 2 and 3, the dominant attitude towards indigenous knowledge and its underlying cosmologies was denigrating, if not actively suppressive or destructive.

Indigenous knowledge, which covers the whole range of human experience (17), can be viewed from as many perspectives as there are fields of study or academic disciplines. For example, Muchena (176) organizes "dimensions" of IKS within a framework of physical sciences and related technologies, social sciences, and arts and humanities.

Another perspective on indigenous knowledge considers its applications. Thus, Mathias-Mundy (161) distinguishes between its usefulness for development in at least two ways: for facilitating the design and implementation of appropriate programs, and as a technology which can be introduced in surrounding areas or even transferred to other regions. In addition, she notes that IK can be a basis for self-sufficiency and self-determination.

In the context of World Bank agricultural development projects, Warren (280) described the case for using IK as straightforward, arguing that components of IK could be used cost-effectively to enhance sustainability, capacity-building, and participation goals. Warren (284) has put forward a similar case for the role of IK in relation to biodiversity conservation, as have Berkes et al (31). Equally, Warren is conscious of a wide range of research and policy issues involved in IK, including the need for guidelines for incorporating indigenous organizations into the development project cycle, mechanisms to involve indigenous peoples and their knowledge in planning and development policies, inclusion of case studies in formal educational curricula, and the promotion of cultural diversity (286).

Surveying the IK discourse, several issues appear striking and are taken up in the chapter 3 review. The most important issue relates to the nature and definition of IK, and whether the IK project¹ should focus on 'IK as it is', viz. current local practice, or consider the notion that 'pure IK', related to traditional cosmology, may still exist. Which approach is taken appears to reflect a philosophical choice and involves further questions to do with the politics of IK, the operational issue of IK components versus holism, and the question of an *etic* versus an *emic* perspective on IK.

In terms of politics, meaningful dialogue has yet to be established, or consensus reached, among the diversity of interests in IK. The politics of IK is an open arena that has been barely charted, and many questions remain about the nature of the different interests, their underlying assumptions, and strategies for accommodation.

Operationally, two trends are taking place in ethnoscience and the application of IK. One is towards a plethora of separate ethnoscientific fields and the incorporation of components of IK into development projects and approaches to agricultural research and extension. The other is a trend towards integration and holism. The latter is particularly evident in social ecological approaches which respect the holistic nature of indigenous people's "traditional ecological knowledge" (TEK) in natural resource management and biodiversity conservation programs.

Mathias-Mundy (161) points out that professionals have not looked carefully at the issue of "the different approach of the two knowledge systems -- holistic versus disciplinary -- [and that..] efforts so far have succeeded in fragmentation of IK systems." If this is the trend, the integrity and even the sustainability of IK systems may be undermined.

In terms of perspective, the espoused intention of "the IK project" is to break from the biased, paternalistic, and often inappropriate, models of outsiders in order to privilege insider perspectives and empower those who have so far been marginalized and underdeveloped by development.

¹ Hereinafter, the term "the IK project" is frequently used to denote the process of rediscovery and promotion of IK that is currently in vogue.

Warren (276) has used the term *emic* to express the inherent order within an indigenous knowledge system, and *etic* to indicate the outsider's imposition of an external order on a local scene. The political and operational issues facing IK -- i.e. the issue of who defines and controls IK, and the disciplines/components versus holism dilemma -- involve fundamental cognitive and behavioral challenges.

For the analytical purposes of this dissertation, the term *emic* is used to distinguish an indigenous, holistic definition of and perspective on IK, and the term *etic* refers to non-indigenous perspectives. This analytical framework can be summarized as follows:

	Etic	Emic
Analytical perspective	Disciplinary	Holistic
Operational focus	Components	The knowledge system as a whole, with underlying cosmology the foundation
Outcomes	IK incorporated by development mainstream	Modern science incorporated in support of indigenous cosmology and knowledge
	Control	Empowerment
	Revision	Transformation

Taking an indigenous, emic, perspective means exploring a traditional culture's own definition and ethno-epistemology of its knowledge system and turning development -- if this is what it should still be termed -- truly on its head in support of indigenous world view and cultural values. This would seem to correspond to an *authentic* (cf. Freire (82)) reversal (cf. Chambers (53)).

This can be illustrated in terms of Nepali cosmology in the words of Pandit

Chhabilal Pokhrel (201):

Sustainable development must be seen in totality. Development in agriculture or any other sector should follow development of the mind. *You* must be transformed, then only the sectors. There should be some people in society, even in every family, who remain celibate - *rishis* - to create the consciousness to guarantee society.

Woodley (298) has drawn attention to differences in modes of thought between Western industrialized and non-industrialized societies, and to the role of cosmology, myth, and ritual in indigenous ecological perception. She states:

Studies that reveal the relationship between ecological adaptation and IK in the guise of myth, superstition, and religion are necessary to understand why humans behave as they do in relation to the environment and their resource use practices (p.175).

Discussing the implications of indigenous ecological knowledge for development, Woodley believes that alternative educational approaches must now be employed, so that indigenous knowledge systems are given high status and respectability. She continues:

This should begin with early childhood enculturation in all countries, industrialized and non-industrialized, and continue with its incorporation into the school curriculum so that the continued reinforcement of the validity and legitimacy of the indigenous knowledge base is maintained. Science curricula could include the inherited knowledge of local ecosystems, of the flora and fauna and local climate. *These studies could be linked to religious studies that examine the basis of traditional belief systems, such as the underlying implications of myth, ritual, and cosmology* (p.177, emphasis added).

In view of the foregoing, the purpose of this study was to explore the ethno-epistemology of indigenous knowledge, investigating especially the role of indigenous cosmologies and sacred beliefs in upholding an indigenous knowledge system, and the relevance of these dimensions of IK to current development challenges.

In this endeavor, the intention was to shed light on the holistic concept of an indigenous knowledge system, and to bridge what was believed to be a gap between etic and indigenous, emic perspectives.

The specific case of Vedic knowledge in Nepal was taken in order to illustrate an

holistic, indigenous perspective on IK in development. The intention was to illustrate traditional agriculture within a cosmological framework that relates agriculture to natural and cosmic forces, and links the activity of farming to health and other related sectors -- thus offering potentially sustainable, indigenous approaches to rural development in Nepal which could be replicable in other similar situations.

Objectives were:

To analyze mainstream and alternative development thought and experience establishing the context for IK discourse.

To analyze trends in indigenous knowledge discourse, and to find out the meaning and relevance of IK as articulated by advocates and custodians of these knowledge systems.

To discover how the cosmology and sacred beliefs of the Vedic tradition are interpreted and applied in the context of modern development, particularly in agriculture, in Nepal.

To determine the implications of these Vedic traditions and knowledge for agricultural education in Nepal.

In terms of **significance**, *Vedic* culture is the core element and origin of Hinduism - a religion practiced by about one fifth of the world's population (114). No ancient civilization parallels Vedic culture in the extent to which thousands of written texts are intact and available for research and rediscovery. Moreover, the Vedic tradition is *living* today, maintained through the ages in its original, pure form by generations of sages, seers, and pandits.

A shared feature of the knowledge systems of all indigenous peoples is the existence of an underlying cosmology that regards the Earth as a living entity and humankind as part of nature. Because they rely on oral inter-generational transfer, the knowledge systems of most of the (approximately) five thousand existing indigenous cultures on earth (70) may not be as highly articulated as that of Vedic culture. In

addition, many indigenous cultures are on the point of extinction and their knowledge forever lost or drastically reduced under the impact of modernizing social change. An understanding of Vedic philosophy and science may be an important vehicle for better understanding and appreciating knowledge systems of other indigenous peoples.

CHAPTER 2.

MAINSTREAM AND ALTERNATIVE DEVELOPMENT THOUGHT AND EXPERIENCE

In Chapter 1, it was observed that indigenous knowledge has been defined in contradistinction to the international knowledge system -- the universal knowledge system of modern science and technology which, for the past two centuries at least, has provided the basis of a dominant, Western conception of progress and development that has influenced virtually every corner of the world.

This dominant paradigm is now increasingly under siege. "The idea of Development stands today like a ruin in the intellectual landscape," writes Sachs (228). "Its shadow obscures our vision." Promises of development -- such as the eradication of poverty in the "third world" and the notion that "underdeveloped" countries could imitate the model of "advanced", industrialized countries and "catch up" in terms of affluence and modern living standards -- have been found to be illusory. Indeed, the "model" of the advanced countries is questionable in view of the ecological devastation it has caused and its inefficient dependence on nonrenewable sources of energy. Furthermore, the very notion of "development" has been found ethnocentric, implying some linear, biological process of maturation defined by reference solely to Western experience. Is every one of humankind's six thousand cultures (70) predestined to this single path?

The revival of interest in indigenous knowledge springs from this disenchantment with the full impact of development -- on societies and cultures, as well as on the environment and in terms of sustainability of the prevailing paradigm. The coincidence -- that indigenous knowledge is currently the subject of interest in the development field at the very time when "development" has become a discredited concept -- should alert us to question whether indigenous knowledge will play the role of just another marginal revision in existing development approaches, or a transformative role in the reconstruction of alternative values, concepts, and strategies.

The full context for IK discourse is a vast arena. One part of the arena consists of

the development mainstream. The other part is a whole realm of thought and activity mostly outside the mainstream, much of it beyond even mainstream consciousness. In order to establish a context for understanding the role of indigenous knowledge in today's world, this chapter surveys this mainstream and alternative experience.

The Development mainstream

Origins

The twentieth century has witnessed the philosophies of disenchantment, anti-positivism (87), and postmodernism, directions of thought reflecting disillusion and skepticism with development and the Western idea of progress. Proponents of indigenous knowledge claim that its rediscovery can improve the development landscape. Indigenous people claim that their cosmologies contain values and ethics to which modern science- and technology-based consumer culture needs to return.

As these claims are evaluated, it seems relevant to be reminded of the origins of the Western idea of progress -- the culture of the Enlightenment (36) and the religious Reformation in Europe. The Western view of progress and development *originated* in an intensely *moral* era. The Reformation "transformed the religion of the European races" (295,p.9) ushering in an ascetic Puritan ethic, rooted in the doctrine of predestination and the notions of "calling" and performance of good works, and in which the highest form of moral obligation became to fulfil one's duty in worldly affairs.

In a related way, the Enlightenment spirit of "reason" was dedicated to understanding the laws of Nature and the truth about God by examining Creation. Many natural philosophers (as scientists were originally known) were drawn to science from an instinctive conviction in a lawful "Order of Nature", and from *faith* in the possibilities of science which unconsciously derived from medieval theology (295).

The pursuit of natural philosophy was perceived as being morally good, and to science were ascribed the traditional virtues. The natural philosopher became a "man of virtue", his objectivity representing the opposite of self-interest and ambition (295,p.7).

The "driving culture" of modern development appears to bear little resemblance to

these moral beginnings. Hillel (102) believes that what went wrong was not the principle of progress, but our distorted perception of it." We have "less communion with the natural world than with the artificial thrills of contrived entertainment" (p.280).

Weber (290) found that:

The Enlightenment, seems [also] to be irretrievably fading, and the idea of duty in one's calling prowls about in our lives like the ghost of dead religious beliefs. Where the fulfillment of the calling cannot directly be related to the highest spiritual and cultural values...the individual generally abandons the attempt to justify it at all...the pursuit of wealth, stripped of its religious and ethical meaning, tends to become associated with purely mundane passions...(pp181-182).

Modern culture forgot frugality and good works. "The spirit of religious asceticism... has escaped from the cage," wrote Weber. But he added, "whether finally, who knows?"

Articles of faith of the dominant paradigm

Theory and practice in development has been characterized by a multitude of sectoral approaches, shifts and revisions through time. However, a set of dominant concepts and components that represent the perspective of the Western architects of the paradigm can be identified.

According to Sachs (228,p.2) the essential premises (from the United States perspective) were:

Superiority of the industrialized nations.

Superiority of the Western ideology of capitalism and democracy.

The promise of "catching up" and the reduction of "underdevelopment".

The notion that all peoples of the planet are moving along one single track towards some state of maturity.

There were several key components underpinning these premises. They were:

The desirability of modernity -- a phenomenon embracing advanced technology, materialist conceptions of quality of life, consumption, specialization, centralization, urbanization and related social, economic, political, and cultural changes (292).

The corollary of modernity, a disdain for traditional culture and religion which

was seen as an obstacle to progress (227,40).

Nineteenth century unilineal conceptions of human evolution as leading from savagery, through barbarianism, to civilization, nonliterate people being called "primitive" because they were thought to be original or primeval (264).

The "law of cultural dominance" providing the "right" to eliminate other cultures (40).

Linear concepts of the development process as "stages of growth" (223), or neoclassical models of "structural transformation".

The assumption of "trickle-down", based on the oddly socialist-looking premise that redistribution was only possible after growth, and, inherent in this notion, a tolerance for inequity as an inevitable, but supposedly transient outcome of the structural transformation (148).

Three core components of mainstream development can be identified:

Objective science and the application of science-based technology to control nature and overcome natural limits (241,271).

Technology transfer.

Professionalization, inherent in the activities of modern science and technology transfer, policy analysis, management, and education.

There have also been two further components:

Top-down planning and centralized state control (195).

The market system (204), including the spread of Western laws and norms providing moral and legal authority for substituting the Western European paradigm (69).

These last two components appear contradictory. However, development that is equated with science, technology, and modernity, and the suppression of tradition, has been pursued by regimes employing both capitalist and totalitarian ideologies.

Authoritarian rule has been used frequently to "manage" the development process.

Consequences of the mainstream approach

The industrialized countries of the "North", along with a small group of "newly industrializing countries" and, elsewhere, "islands" of modernization based on dualistic technology-transfer policies, are now enjoying unprecedented material advances and wealth.

Often overlooked are the historical conditions that opened the way for the political, technological, economic, and cultural modernization of societies -- in particular, colonial exploitation and revolution -- which Berger (28) calls "a history of pain." The human anguish continues today, whether legitimated by capitalist ideology, as in Brazil, or by communist ideology, as in China (28).

International dependence paradigms offer competing explanations for modernization in terms of "underdevelopment" which is seen as a "creation of the development enterprise itself" (72) -- a process of "steadily increasing inequity and marginalization of people and resources rooted in political powerlessness and cultural dissonance" (45,p.24).

What "underdevelopment" feels like is captured vividly by such authors as Vandana Shiva (241), who links the Green Revolution to social unrest, religious fundamentalist revival, and political violence in the Punjab, and Winin Pereira (197), writing on the spread of unsustainable development in India. Their analysis of the "other side of history" (197) conforms closely to explanations of current African famine by such authors as Rau (214) and to accounts of historic and contemporary suffering of tribal, or indigenous peoples¹, whom Bodley (40) terms "victims of progress."

Incorporation into the world market economy, Bodley believes, has *lowered* the standard of living of indigenous people, and, summing up their bitter experience of extermination, political integration, land dispossession, cultural modification, banning of tribal religion and despoliation of sacred sites, suppression of language, and ecocide, Bodley concludes: "Paradoxically, tribals were destroyed because global technological evolution outstripped social and political evolution in the twentieth century."

Saravia (231) classifies the consequences of Northern development as ecological deterioration, social instability, and economic unbalance. It is important to avoid a Western, sectorized perspective. In reality, as Chambers (53) captures in the concept "integrated rural poverty" (p.108), disadvantage comes in clusters, in a "deprivation trap"

¹ For example reports by IWGIA, Cultural Survival, Survival International, and Amnesty International.

of isolation ,powerlessness, vulnerability, poverty, and physical weakness (p.112). Thus, social, economic, and environmental imbalance and deterioration are closely interconnected (241).

Nevertheless, Saravia's categories can be briefly elaborated to include:

Gender and ethnic imbalance.

Social tension and unrest (241).

Suppression of local initiative, dependence, and problems of local capacity.

Dualism and imbalance in society; inequity, persistent poverty, and problems of "participation" (250).

Demise of rural communities, and unrestrained urban migration.

Stratification, dividing once unified communities, replacing mutual aid-giving by hired labor, and causing small farmer displacement and landlessness (47).

Dying out of traditional festivals and religious beliefs relating to agriculture, and their replacement by national, secular festivals (47).

Breakdown of traditional community discipline and cultural norms that maintained community self-reliance, and the predominance of economic considerations over religious, cultural, and social relations in agriculture (47).

"Diseases of development" (40) and pesticide and anti-biotic residue-contamination of food (183).

Inappropriate technology choice.

Political corruption and "capture" of benefits (72).

Human rights abuse, cultural extinction, and destruction of indigenous knowledge.

Loss of meaning and of confidence (14).

Spiritual emptiness (263).

Specifically in agriculture, consequences have included:

Energy/economic inefficiency of the modern agricultural production and distribution system (281).

Ecological non-sustainability, evidenced by soil loss, deforestation, pollution of ground and surface water, pesticide resistance, aquifer depletion, salinization of soils, escalating fossil fuel costs (Francis, 1990 in 102).

Yield instability of "high yielding varieties", and declining yields of major cereals across Asia -- "the Post-Green Revolution Blues" (50,p.26).

Destruction of biodiversity, for example, the loss of 1,500 indigenous rice varieties in the space 15 years in Indonesia due to monoculture of high-yielding varieties (70).

Revisions

As one after another imbalance, inequity, or unintended consequence became intolerable, development agencies introduced revisions on the margins of the dominant model. Primarily, these have been efforts to make the development process more participatory, equitable, environmentally or socially sound, integrated, and sustainable. The revisions in approach have tended to accumulate as accretions, making project design, implementation, and evaluation increasingly complex. However, reality has lagged far behind rhetoric due to biases in values and perception, and gaps between espoused and actual behavior.

Some of the main revisions include:

Agrarian reforms.

Women in Development components.

Tribal development and resettlement programs.

Introduction into project design and evaluation of Social Soundness Analysis and Environmental Impact Assessment.

Institutional development, public administration, and training efforts.

Decentralization schemes and Integrated Rural Development Programs -- attempts to build local capacity and to improve coordination between sectors and service delivery.

Special programs for "targeting the poor".

Management innovations for improving delivery of extension messages (e.g., the Training and Visit system).

Interdisciplinary team/systems approaches in agricultural research and natural resources (e.g., Farming Systems Research-Extension, and AgroForestry).

Participatory approaches in agricultural research, extension, natural resources management, and rural development (e.g., Participatory Technology Development (PTD), Farmer Participatory Research (FPR), Social Forestry, Watershed management, Rapid Rural Appraisal (RRA), Participatory Rural Appraisal (PRA),

Participatory Action Research (PAR), and group development.

Basic Needs programs to overcome structural inequities and adjust for the failure of growth and redistribution.

Emphasis away from state-led development across a wide range of poverty-related and rural development sectors toward NGOs (nongovernment organizations) and PVOs (Private Voluntary Organizations) which claimed strong client orientation and ability to reach the poor, participatory management style, innovativeness, and low-cost implementation (255).

Appropriate Technology.

Biodiversity conservation.

Limits

While the revisions, to a greater or lesser extent, ameliorated certain problematic consequences, their impact on the dominant paradigm can be regarded as only marginal. Some examples of the limits can be illustrated.

Radical agrarian reform programs have been limited to revolutionary situations, and, even then, tended to flounder after the revolution, hit by institutional limits on service delivery and extension, partly caused by bureaucratic disloyalty. The more complex, comprehensive, multi-actor, multi-goal, and long-run the reform, the more problematic it became to implement, and the more political power and resources were needed (174).

Women in Development components have been reported as suffering, at least initially, from tokenism, resistance, and institutional paralysis in bureaucracies responsible for implementing the new mandate (247), and from weakness of field-level agencies with a welfare history for implementing primarily economic programs (46).

Social Soundness Analysis involved ambiguities, questions of socio-cultural feasibility and acceptability -- "the least amount of social disruption consistent with development objectives" -- ultimately being answered politically (119).

On decentralization, Cheema and Rondinelli (59) described it as a "schizophrenia" for governments, the problem being that, as it involves transfer of power, "governments don't really seek it".

Integrated Rural Development (IRD) was beset by contradictions, as in the simultaneous objectives of income growth and equity. Theoretical complementarities between sectors could not be as easily implemented on the ground (226). In reality, IRD projects became mechanisms for imposing centrally mandated programs on communities. Essentially, the failure was in using a rational development administration model to deal with structural problems rooted in issues of political power.

Through attempts at **targeting the poor** (to stop benefits being "captured" on their way down the bureaucracy and by local elites), much was learned about the multidimensionality of poverty and gradations within it (44,53). Chambers (54) moved the debate from the "poverty line" thinking of IRDP, with its blinkered, focus on measuring income flows, to the concept of a "livelihood line" which stretched awareness beyond the desperate level of survival strategies, through dependent security-of-assets strategies, to independent self-respect strategies dealing with vulnerability and powerlessness which were "more threatening to tackle".

Mainstream agencies did find these dimensions more threatening. The US Congress wrote a letter on the subject in 1982 expressing the view that targeting was:

Imposing our politics on other countries... aid is foreign policy and is given for broader support of governments we consider friendly...we should not load our values on them as well...Instead of targeting.. aid should be neutral...it should strengthen the economic system without strings attached.

As John Thomas, recipient of the letter, stated: "but there is no such thing as neutrality. If you don't target, you are still targeting others" (257).

Participation has been understood in either of two ways: i) to *involve*, or consult, "them" in what "we" are doing for them, generally to improve the efficiency of "our" service delivery, but resulting in "their" dependence; or ii) to *enable* or *empower* "them" to determine themselves both what they want and how their priorities are to be met, resulting in independence and self-respect. The two notions relate to two conceptions of democracy -- elitism, which protects professionalism against mass participation in pursuit of stability and efficiency, and pluralism (89). The reactionary, elitist understanding has been dominant by far, suiting the top-down management style, and centralization of

authoritarian regimes.

Exciting methodological advances have been made, mainly in the NGO sector over the past decade especially. The aim of these participatory approaches has been to break down the hegemony and biases of professionals and empower those on the periphery (52). Where the cutting edge has reached is exemplified by one of Chambers' recent and characteristically challenging insights (56):

In writing this paper I have found myself repeatedly slipping back into the normal mindset, of us learning from them, and helping them to give us better information, rather than helping them to do their own analysis and to do it better. This mindset is much of the problem. The idea is not to improve our analysis, or even our learning, but their analysis, and their learning. Fortunately, in moving in that direction, dominoes have fallen one after another as it has been revealed again and again that they can do what we thought only we could do, and often that they can do it better (p.14).

Chambers notes that the most recent domino to fall has been facilitation -- farmers, not outsiders, have been found to be the best facilitators.

As always, Chambers is light years beyond average professional cognitive and behavioral levels, the majority of whom have yet to make the transition to "learning from them". Chambers himself puts some of the advances in participation into perspective. Referring to Rapid Rural Appraisal and Participatory Rural Appraisal, he states (57):

Globally, RRA and PRA have to date still made little impression in universities and training institutes. The scale of adoption of RRA and PRA remains minuscule compared with the scope. The potential for application in training and education remains vast and almost entirely unrecognized (p.62).

Chambers' thinking is reflected increasingly in critiques of past participatory efforts which acknowledge that, to date, it is still "outsiders" who are inducing change (258, 17), and that attempts to integrate centralized administration with "bottom-up" development are bound to have schizoid outcomes like "you have full authority to manage the forests the way we want"(77).

In this vein, Gupta (94) critiques RRA as being still "extractive", and Scoones (235) critiques PRA as being still in the "old mold -- to increase involvement." The challenge is to accomplish the reversal of making *outsiders* do the participating in the

development efforts of rural people (17). In this regard, the Freire-inspired dialogical methods of "activist participatory research", which includes Participatory Action Research, represent the most radical approaches to enhancing people's awareness and confidence and to empowering their action (57,p.2).

Literature on the **nonprofit sector** points to dominance, particularly in the third world, of the state and market, and of professionals, over the voluntary associations of family and community -- variously termed the "independent", "nongovernment", "social", or "third" sector (274,84,293,29).

Since the 1970s, development activity by nongovernment organizations (NGOs) has increased in importance, at times even supplanting the role of the state in places, like Mozambique, and now Somalia, where governments entirely collapsed. In 1986, third world development activities by "Northern" PVOs (Private Voluntary Organizations) accounted for \$3.3 billion from private sources, and \$1.5 billion from official aid sources (OECD, 1986:21, cited in (43)), and accounted for 22% of total Canadian aid funds.

Evaluations of the NGO/PVO contribution vary depending on ideological perspective. Tandler (255) settles for a limited "less noble" role for PVOs as "expanding, or improving under existing techniques, delivery of public services" in an interdependent partnership with the state. Pandey (190) distinguishes between *service-oriented* and *struggle-oriented* NGOs, characterizing the former as paternalistic, outside, and dependency-creating, and the latter as endogenous and movement-oriented, confronting and resisting oppression.

The struggle end of the spectrum embraces such activities as: policy advocacy (8,129), nonviolent direct action (33), human rights advocacy, legal environments and legal resources, (67,85) protest movements (239) public education (145), grassroots activism aimed at democratization and rejuvenation of governance (146,145).

Economic theories depict the nonprofit sector as highly interdependent -- a microcosm of the economic system (293). In a real sense, the "independent sector" is not so independent, and flourishes only if supported by wider society as defined by state regulation and exemptions (274). This inherent limit on the NGO sector has been

responsible for tensions and "gaps" between its espoused "articles of faith" and actual performance (255). Distinctive NGO roles, such as innovation or advocacy, and styles of operation, tend to be constrained by dependence on government -- and associated professionalization -- leading to public agency, vendorism, and other goal distortion.

Nonetheless, the NGO sector has become increasingly adept at managing these tensions and at identifying auspices for activities nearer the struggle end of the spectrum. Korten conceptualized three generations of NGO development program strategies (145):

	Generation		
	First	Second	Third
Defining features	Relief & Welfare	Small-scale self-reliant local development	Sustainable systems development
Problem definition	Shortages of goods and services	Local inertia	Institutional & policy constraints
Time frame	Immediate	Project life	Indefinite long term
Spatial scope	Individual or family	Neighborhood or village	Region or nation
Chief actors	NGO	NGO + beneficiary organizations	All public & private institutions that define the relevant system
Development education	Starving children	Community self-help initiatives	Failures in inter-dependent systems
Management orientation	Logistics management	Project management	Strategic management

Commenting on their implications, Korten stated, "the more fully the NGO embraces third generation strategies, the more it will find itself working in a catalytic, foundation-like role rather than an operational service-delivery role" toward the goal of democratization "defined in terms of broadly distributed control over political and economic assets, and the open flow of information" (p.149,147).

Korten's view is echoed by Brodhead (43) who saw NGOs shifting emphasis increasingly toward:

Creating a policy environment favorable to participatory development, and providing support for conscientization activities and empowerment...[involving] changes in development education and advocacy strategies, a strengthening of NGO institutional support, increasing cooperation with other social movements, and continuous adaptation to the changing international and national socioeconomic environments.

In Korten's language, this is "strategic organization".

The goal of **Appropriate Technology (AT)**, according to Stewart, was to spread the benefits of technology and investment across the population, and to incorporate everyone, not an elite minority, in the process of development. The concept grew in reaction to the creation of dualistic, inegalitarian societies "due to the unselective introduction of modern technology into poor countries" (249). Stewart believes that appropriate technologies, such as oral rehydration therapy and the small tools developed by IRRI, have benefitted millions of people across the third world.

In a strong critique, Eckaus maintained that the AT movement had accomplished little, due to loose reasoning about what "appropriate" means, and due to simple-minded technological determinism -- i.e., the view that inappropriate technologies were the "single barrier" to development. Eckaus concluded that the reason why the AT movement remained popular was that it was "easier to use technology as scapegoat for social, economic, and political problems, as though technology is disembodied from context" (71).

Appropriate technology experience is likely to hold important lessons for IK, the main ones emerging from the Stewart/Eckaus debate being:

That politics influences economic policy which influences technology choice.

That AT can be neither precisely defined nor uniformly applied, as "appropriateness" is contextual.

That reversals in macropolicy environment are necessary, away from prevailing policy biases which favor large scale, hi tech, foreign alternatives.

That there is a need to identify supportive political elements and policies.

Outstanding problems of the mainstream

The experiences of the revisions teach a great deal about the resilience of the dominant paradigm. Outstanding problems and issues can be grouped in five broad categories: professional paternalism, political-economy and human rights, problems of understanding, ethnocentrism and cultural dominance, and moral-spiritual consciousness.

Professional paternalism. Disregarding the rhetoric, there has been a distinct failure in general to go beyond a paternalistic praxis of participation. Hobart (111) observes how "the discourse of developers is often resistant to counter-evidence" (p.12) and that even in "bottom-up" approaches, the terms and kind of action expected remains defined by superiors. Similarly, Mazur and Titilola (166) note: "research and extension remains highly centralized and vertically structured, essentially a non-participative structure" (p.28).

To Freire, the dominant, oppressive praxis amounts to cultural invasion and the imposition of world view as long as the ultimate seat of decision is with the "invaders"(82). Freire warns that even the discovery by oppressors of their oppressive nature may not engender true solidarity, but paternalism leading to still more dependency. Only entering the situation of the oppressed breaks through this limit.

In reality, if it is not a reductionistic calculus (for example, "targeting" tactics), to many professionals development is either a business, or a game (19).

The paternalism problem is epistemological, cognitive, and behavioral. Chambers has probably done the most to challenge the biases of what he calls "normal professionalism" and to advocate for a "new professionalism" that implements "last/first"

reversals (discussed in more detail under "Alternatives" below). However, as technological sophistication increases the trend, if anything, is toward ever greater professional control. As Chambers commented during a meeting of Indian experts discussing biotechnology and the social and ecological consequences of introducing new genes and disturbing natural balances in the living world (55):

What characteristics to go for, what methods, who can use them, who can have access, how... all these decisions are taken by us, based on our judgement and our interests (p345).

Political-economy and human rights. The capacity of the marginalized to negotiate with developers remains weak. Human rights, including freedom of association and hence freedom of action of the social, or NGO, sector, are severely limited under authoritarian regimes. Political realism dulls the determination of professionals to confront dominant structures, even after they have accomplished sophisticated analyses confirming the oppression of the mainstream paradigm (258). It also sets limits on targeting strategies, favoring "easier" tasks that fit within political-economic constraints (256).

Analysis of the problem of inappropriate technology choice reveals macro-economic biases favoring dualistic, inequalitarian societies (249), and that the driving force for technology transfer has little to do with the use value of technology, but involves *images* of what is modern, and issues of who is paid off and where deals are made -- questions of vested interests. Furthermore, political-administrative reasons explain why states substitute simplified ecosystems more amenable to centralized control for the diversity of natural ecosystems (241). Thus it was that the government of Zanzibar, despite 97% default rate on farmer loans and 50% land abandonment, was still trying as late as 1989 to push a centralized tractor-serviced, single rice variety-based, technology package on peasant farmers (296).

Bates (22) has described the realm of public services and projects in West Africa as a "system of spoils", a characterization closely conforming to Bardhan's (20) analysis of the political economy of development in India, in which he identified "three proprietary classes" exercising undue power: the industrial capitalist class, rich farmers,

and professionals in the public sector.

Timmer (260) has described the power of large corporations, with their skilled analysts and access to the press and political leadership, to influence government policy in the Philippines. Similarly, large farmers act as reference group for agricultural research, leading to Green Revolution technology choices not consistent with latent incentives of the economy, and to the displacement of small farmers (90). The film "The Global Assembly Line" shows graphically how the interests of multinational corporate profits, investor returns, bank lending, and rich-country consumer demand interact with host government debt servicing needs and the interests of comprador elites to produce dehumanizing working conditions that violate human rights in the third world.

Foreign aid also tends to march to money over technical or social considerations, the heroes of lending agencies being those successful at moving money, and marginal projects being approved if they meet the money criterion. Thomas (257) explained how both donor and recipient institutions in the aid-giving-and-receiving system hold stakes in perpetuating the system. Aid is "owned" by these institutions, and the needs of the system tend to replace espoused goals of development.

Aid has also been seen as a mechanism to regulate the poor, reinforcing the norms of work while maintaining socio-economic inequities. Piven and Cloward (199) have shown how, even in the West, the function of public welfare is to regulate the poor. It is initiated and expanded during times of civil disorder and mass unemployment, and contracted again when political stability is restored.

Evaluations are also inherently political, a political process usually determining the question of whose perspective is being served -- those of politicians, implementing agencies, donors, contractors, beneficiaries or clients, or the evaluators (294).

Added together these political tendencies explain the prevalence of human rights abuse and suppression of local initiative by repressive, authoritarian governments receiving Western aid and participating in Structural Adjustment Programs (166).

Problems of understanding.

Where is the wisdom we lost in knowledge? (T.S.Eliot)

To some extent, mainstream comprehension of the many dimensions involved in the development process has deepened and broadened since the fifties when the project was conceived of in purely economic terms. Today's understanding of poverty, and the need to understand the logic and workings of entire farming systems before introducing changes exemplify advances made. However, understanding of social implications has lagged far behind the momentum of modern scientific and technological development (112), and various evidence points to the nature of mainstream knowledge as one cause of the problematic consequences of development.

Working under pressure -- within the vortex of the rapid momentum of change -- the most evident difficulty of the mainstream is to visualize and manage activity holistically, as Thrupp notes in her observation that FPR and FSR (Farmer Participatory/ Farming Systems Research) remain a "technology fix" by unwieldy interdisciplinary teams with management difficulties constraining articulation with policy (258). A specific difficulty is to integrate the positivism and objectivism of natural science with the semiotic approaches of social science (245).

Freire (82) distinguishes between "focalized" activities and "comprehension of totality", and warns that focalized views of problems, as in targeted programs, intensify alienation of oppressed "target groups" and hamper their ability to see reality (p.111). In this respect, many equity-oriented revisions have had a "divide and rule" effect which probably also reflects the professional paternalism problem. As long as the mainstream remains convinced that it should determine what development is, and control the process, paternalism (and ethnocentric and moral constraints discussed below) will continue to impede understanding.

Problems of understanding are defined here as those problems caused by limitations of perception inherent in the scientific paradigm. Conventional wisdom states that scientific knowledge, from careful, systematic investigation, offers the most valuable contribution to decision-making (15). However, the consequences of development justify

questioning some of the fundamental claims and precepts of the science upon which it has been based. Essentially, the problems have to do with the distinction between supposedly objective (value-free), positivistic knowledge and *insight* (102).

Firstly, the claims of science to rationality and *objectivity* -- faith in reasoning based on objective facts rather than in beliefs or values. Facts can be inaccurate and mislead. In "OK The Data's Lousy, But It's All We've Got (Being A Critique of Conventional Methods)", Gill demonstrates the way in which wrong data from censuses is used for policy analysis, leading to wrong decisions. Nepalese hill agricultural cultivation statistics "jump", by as much as 2000% for some localities, from one year to the next as the cadastral survey is completed. Despite being spurious, the data are accommodated routinely in national statistics. In fact, the opposite is true in the Nepal hills. Cultivation is on the decline due to deteriorating soil conditions and seasonal migration (88).

It is this kind of faulty intelligence and misperception of rural realities resulting from conventional "rural development tourism" and "survey slavery" that spurred more participatory, learning approach revisions (53).

On its "*universality*" and being "*value-free*", critics argue that there is an imposition of specific interests and values represented as universally valid through the deployment of apparently rational categories and technical language. The burgeoning fields of ethnoscience (discussed in chapter 3) provide contrary evidence to the claim of universality by showing that there are in fact multiple, and more radical, ways of observing, ordering, and sorting natural data (64).

The simplification of problems through the implied culture-free cognition model (64) of *reductionism*, another scientific precept, provides the power of science to investigate, predict, and control. Berkes et al. note that resource appropriation works best through simplified systems, and in terms of *exploitative* efficiency (material and dollar yields), the Western science of resource management has been notably successful (31). However, by definition, the quality of understanding so reached can never be more than partial. Proponents of alternative agriculture such as Shiva (241) and Kloppenberg (141) believe that it is this limitation in particular which has undone modern agricultural

science. Its converse is the synergy of combinations and systems found in holism. Resource management for sustainability requires understanding of systems in all their complexity (31).

Bacon believed that "recalcitrant nature" was only subdued by submission -- by putting her "on the rack" (25,p.123). This instinct and motive of science, *to control*, and its offspring -- the belief in independence and separateness from, and command over the natural world by use of sophisticated technologies -- still pervades the Western scientific mentality (31), and is a trait to which is attributed much of the world's current environmental devastation (241). It relates to the Cartesian cosmology which saw the universe as a great machine (300).

Two final precepts, *relativism and positivism*, need mention. Relativism involves denial of absolutes, including moral standards (183). Positivism avoids subjective experience (254), believing that all that really exists is that which is confirmable through observation, sense perceptions being the only admissible basis of human knowledge and precise thought. Truth is equated with "objective fact". As is discussed below, modern physics has produced challenging evidence countering positivism and objectivism and the whole notion of "exact" science with "independent observers" (300,p.134).

Each of the essential features of science -- reductionism, relativism, and positivism -- alone contains challengeable assumptions. But it is in their interaction, at the point...

When we pass beyond the abstraction, either by more subtle employment of our senses, or by the request for meanings and coherence of thoughts, *[that] the scheme breaks down at once*. The narrow efficiency of science was the very cause of its supreme methodological success. For it directed attention to just those group of facts which, *in the state of knowledge then existing*, required investigation (295,p.24; emphases added).

Whitehead shows that it was the Cartesian acceptance of scientific cosmology at face value that subsequently adversely affected the quality of European thought, excluding the proper role of philosophy from harmonizing scientific abstractions. Thus *true reason*, the trust that the ultimate natures of things lie together in an aesthetic harmony which excludes mere arbitrariness, was left behind, and observation became not so dispassionate (295).

In conclusion, while science can be powerful as a methodology and as a tool, questions can be raised about each of its fundamental assumptions and precepts -- objectivity, rationality, universality, reductionism, relativism, and positivism. Over-confidence in "scientific evidence" is particularly dangerous when there is "mechanical and uncritical application of habits of thought to fields different from those in which they have been formed" (270). Von Hayek was referring to transfer of methods from "the brilliantly successful physical sciences" to the social and economic policy fields, where, he believed, "the gravest errors" resulted from having:

...better "scientific" evidence for a false theory, which will be accepted because it is more "scientific", than for a valid explanation, which is rejected because there is no sufficient quantitative evidence for it (p.3).

Von Hayek's "Pretence of Knowledge" is:

To act on the belief that we possess the knowledge and the power which enable us to shape the processes of society entirely to our liking, knowledge which in fact we do *not* possess, [and which] is likely to make us do much harm (p.7).

Ethnocentrism and cultural dominance.

The theoretical concepts of modern science have been found to be simply not benign world views. Rather, they have been found to carry power, dominance, and the capacity to exclude (38).

...This was done by others, who on arriving, imported and substituted their own religion and morality, laws, science, and understandings... and pursued their own ends, arguing that their world view, their paradigm, was the only correct one: an intellectual version of monotheism which prevailed to the detriment of all others (69).

Development is an ethnocentric term that imposes choices made by outsiders (40).

One of the latest revisions is mainstream recognition that biodiversity -- the variety of the world's genes, species, and ecosystems (93) -- is associated with ecological and production stability (61) and is important for sustaining the biophysical basis of human society (31).

Being a recent "revision", biodiversity presumably reveals contemporary

development attitudes and approaches. What is revealed by current biodiversity conservation programs is that the mainstream still has a long way to go to conceptualize biodiversity within a cultural, rather than a purely economic, or a purely environmental, paradigm.

At one extreme, Hyndman (118) describes classic preservationist approaches which, by relocating them to "buffer zones", deny indigenous people access to their ancestral lands, resulting in social collapse, removal of livelihood, greater economic and cultural dependency, and loss of indigenous knowledge and cultural diversity.

Gupta and Ura (95) appear to interpret this as a case of bureaucratic paternalism, as the "global concern assumes a state of degradation and the absence of local institutions" (p.36), assumptions which lead to bureaucratic intervention rather than indigenous, grass-roots-based solutions.

The other extreme of "green capitalism" offers "an economistic approach to the environment as a set of resources for consumption" (93,p.10) which is at complete variance with indigenous peoples' holistic view of the environment. Furthermore, based on analysis of the Biodiversity Conservation Strategy developed by the United Nations Environmental Program, World Resources Institute, and the International Union for Conservation of Nature, Gray argues:

Without complete social control over their production and marketing, indigenous peoples cannot enter the market economy on their own terms. Dependency and eventual poverty then face indigenous peoples whereby consumer demand from the North dictates its own production needs onto the South... The biodiversity strategies currently under discussion seek to advertise the benefits of indigenous peoples' knowledge, yet past experience shows that this knowledge almost invariably disappears into the hands of industrial and agricultural concerns... Once again indigenous peoples are treated as passive victims or recipients of development programs sent down from on high (pp iii-iv).

Gray concludes:

Until indigenous peoples are at the center of environmental conservation there will be neither biological nor cultural diversity in the world... Cultural diversity for indigenous peoples is every bit as important as biological diversity for environmentalists.. [Further,] indigenous peoples have demonstrated that they are

the best conservers of their environment which they use and manage according to their own cultural premises (pp iv, 13, ii-iii).

In essence, current biodiversity prospecting is perpetuating the colonial model. It is not interested in indigenous knowledge. It asks only "just show us where the plants are", just as natives showed the colonial powers where the good pastures and minerals were to be found.

The origin of these attitudes is explicated by Bodley (40) who shows how the "law of cultural dominance" is invoked to provide the "right" to eliminate others. Ethnocentrism and labelling people "primitive" is a product of the theory of classical evolution, a nineteenth century paradigm which assumes that nonliterate peoples are the earliest living representatives along a straight evolutionary path that led from savagery (to which, additionally, dark skin-color is attributed), through barbarianism, to civilization (attributed as "white") in a series of predestined stages. Nonliterate people were called "primitive" because they were thought to be original or primeval (264).

Calling native people "barbaric", or even conceptualizing them as nonhuman, provides the intellectual basis to justify exploitation and subjugation of people (275), particularly "if you convince yourself you are helping to remove them from a "harsh and brutal life"" (51,p.3).

Social Darwinism is still embedded in our ideological system and in literature on culture change (40). Professionals still fail to recognize that they themselves work and think within the confines of a "scientific" culture, and reject other systems of knowledge as inferior, or pre-scientific, characterizing farmers' knowledge as backward, conservative, inefficient, inferior, and based on "ignorance" or myth (258, p.3). To Taylor (254) it would seem that incommensurability is assumed between Western "rationality" and what is still seen as the "irrationality" of other cultures. However, the judgement of lesser rationality of others is based on misunderstanding, essentially due to "etic" perceptions which fail to understand the culture studied in its own terms (pp136-7). The Aschers (16) conclude that the myth of the childlike, pre-logical primitive persists for two reasons: first, that there is "political, social, economic, and ideational value in

maintaining that most people in the world are our intellectual inferiors"; and second, in the belief that higher technology goes with higher intelligence (p.129).

Moral and spiritual consciousness.

500 years of our history have seen tribes removed from ancestral lands, significant living natural resources exterminated, vast areas of land expropriated without recognition that a wrong has been done and without compensation... destruction of ways of life which reflect spiritual and moral value systems and continuing knowledge of viable living relationship with the Earth (69).

Development has been shown to be plagued by perversity and inappropriateness. Policy biases operate against what is appropriate. Interventions that are carried out for rural development only seem to fuel urban growth (218). Government and market systems "fail".

Revisions are introduced on the margins, but basic premises are not questioned, nor is the poverty of a model of progress that tends to raise levels of inequity and pain in the process of "development". Thus it is that human rights violation and dislocation inherent in the authoritarian control of the development process was seen, in a typically modernist manner (113), as a separate sphere to be dealt with by the UN agencies and nongovernment Human Rights watch organizations. Only very recently have questions of democracy and human rights begun to be formally incorporated into the mission of development agencies, for example, USAID (267). Questions of cultural meaning, indigenous rights and indigenous knowledge have yet to be formally incorporated, although the UN Decade of Culture and 1993 Year of Indigenous Peoples appears to be heralding change in that direction.

In one sense, the problem is one of understanding, as powerful tools (i.e., of science, economics, management) serve too narrowly defined goals, such as yield maximization (90). Economists admit that there is a lack of understanding of the limited competence of markets which Lindblom describes as simply a *tool* -- good for some purposes, not for others. "Consciousness" is required for their proper functioning (153). Similarly, Schultze discussing questions of social intervention, acknowledges "there is no

guidance as to how to intervene" (233). And Okun (185) advises that "the market has a place, but needs to be kept in its place... other values must be protected from the potential tyranny of the dollar yardstick" (p.3).

As much as any profession, development should involve ethics, moral responsibility, and moral *vision* (220, 243), yet Warwick (288) believes that development has not followed ethical guidelines -- that there is no moral foundation or ethics of social intervention and public administration. No consciousness. All is relativistic and opportunistic -- particularly the new version of public administration dominated by bureaucratic politics and aggressive furthering of agency interests. Rather than a set of moral principles, there are only "concerns". Ethical statements and value judgements are looked upon as "unprofessional" by social science. As a solution, Warwick proposes United Nations guidelines on human rights, showing how, if applied, they would lead to freedom, truth telling, welfare, distributive justice, and national sovereignty (p.195ff).

In a world dominated by states and large corporations, Gamwell, in a bid to recognize public-regarding independent associations as the "first sector" in society, argues that moral and religious values must guide political systems (84). Yet Taylor states that the nature of modern identity tends to make us reluctant to acknowledge a moral dimension (254).

Miller (171) believes:

This culture has almost no ecological, aesthetic, or spiritual understanding of the mystery of our being because it emphasizes rational, hierarchical control of thought and behavior for the sake of economic and political goals.

Earlier, Miller stated (170):

Modern culture has lost its reverence for life...the scientific technological worldview is built on the desire to conquer and exploit Nature. One cannot love in any realm while ruthlessly exploiting the rest of Creation.

Ultimately, if the "seamless web of science and technology" is *socially shaped and constructed*, moral choices guide problem redefinition and technology choice (198).

The mainstream's outer limits

The U.N. stated a decade ago that "the elusive key which would turn off the source of the conditions that generate poverty has not been found..."(265). One wonders now whether the key has not been found, or whether it is found, but has not been turned. Both ideas, and experience, are plentiful.

Ideas such as "People-Centered-Development" (144) and "Human-Needs-Centered-Development" (196) have been elaborated, and translated into development management guidelines by authors like Bryant and White (45). Chambers has long advocated professional reversals which would enable these guidelines to be followed (52,53). Although these alternatives have been accommodated to some extent in mainstream rhetoric, gaps remain between espoused rhetoric and the theories-in-use that create reality (13). The gaps are not due simply to political realism. They persist in the paternalistic interests of Chambers' normal professionalism. Ethnocentrism also "legitimizes" inequities between cultures, operating in what is essentially a moral-ethical vacuum of responsibility.

The factor that appears to create this vacuum that permits ethnocentrism, paternalism, and realism to prevail is the dominant, "universal", mode of understanding of the modern, Western knowledge system -- "objective" science. Specifically, it appears that the positivism, reductionism, and relativism of this paradigm involves an inherent separation of known, knower, and process of knowing, a Vedic concept introduced more fully at the end of this chapter. It is this separation which divorces knowledge of facts from spiritually and morally-based insight, and which separates humankind from nature, from an ethical sense of responsibility for others, and from realization of Self.

The key to closing the gaps has not been implemented by the mainstream possibly because, even in the revisions, effort has been placed primarily on symptomatic, surface distortions -- felt in the environment, political-economic, and social realms -- rather than on deeper-level problems of understanding, culture, and morality. This corresponds with Macy's (155) observation that the dominant model has focused on only two dimensions of development: the social, and the economic.

To an extent, the revisions have shown that the symptomatic distortions can be tackled through "games" and rational-legal reforms in the development business. Problems of paternalism can also be tackled, to a limited extent, through behavioral interventions (58,13).

However, the further one progresses into problems of understanding, culture, and especially into moral-spiritual dimensions of development, the more one enters realms that revisions have left beyond the pale.

In sum, it would appear that problems of understanding, culture, and morality *inherent* in the dominant model pose possibly a greater challenge to the mainstream than symptomatic distortions for which revision, reform, or political action may suffice.

Alternatives beyond the mainstream

It is evident that modern instability, injustice, and conflict can in many cases be traced directly to development initiatives (241). While governments, private enterprise, and international development agencies have monopolized the mainstream policy system, outside the margins -- depending on the political situation -- a wide diversity of dissenters has been reflecting, speaking out, and acting to challenge the dominance of the mainstream.

Earlier on, movements promoting development alternatives were seen from the perspective of the dominant, rational paradigm, as "fringe" phenomena. But, with each decade, there has been a trend towards accommodation of their perspectives (69). For example, human rights are now, on a rhetorical level at least, a cornerstone of U.S. foreign policy, and NGOs and PVOs have become partners to official agencies in development policy-making and field experimentation and implementation.

Most significantly, culture change is occurring in industrialized societies back in the direction of more holistic education, health, diet, and lifestyle, respect of nature, and spirituality. In what appears to be a rising tide of human consciousness, grassroots activists are searching for a more meaningful and sustainable way of living on this planet in a common quest which unites populations from Europe and North America with

indigenous peoples in various parts of the world. This change in consciousness is fuelling an engine of activity which is beginning to impact the mainstream, especially in rainforest protection, traditional medicine, and conservation of biological and cultural diversity. Based on the hopeful signs of this "tribal vision of the world", Hillel believes there is a case for "conditional optimism" about the environment (102).

The nature of the alternative paradigm can be considered through contrast with the dominant paradigm in terms of the same issues -- professionalism, politics and human rights, mode of understanding, culture, and moral and spiritual consciousness.

New professionalism

The alternative is to increase the capacity of people to influence their own future (45). Rather than professional control, the emphasis is on "listening to their song" and the role of indigenous leaders and communities making their own basic socio-economic and spiritual choices (183). Cashman refers to "documenting the silence" -- listening to other (including female) epistemologies, ontologies, and cosmologies (49). A field of "oral history" is currently developing (192).

In agricultural research and technology generation, the knowledge of farmers is placed first, and scientists learn from farmers (83), supporting the farming community in their own technology development efforts to produce appropriate agricultural development based on theory grounded in existing experience. Recent "Man and the Biosphere" projects are reflecting more understanding of the contribution of local inhabitants to environmental conservation. The farmer is also the starting place in the latest thinking on crop genetic diversity which emphasizes *in-situ* conservation rather than the repository approach of formal gene banks. Farmers are to be directly involved in plant breeding, decision-making, and networking, and retain control over their germplasm.

Chambers' contrasts of "first" versus "last" thinking, and verbal versus visual, and extractive versus enabling modes of intervention capture most elements of post-paternalistic new professionalism (53, 56). His tables are provided in Appendix I.

The influence of Paulo Freire's *Pedagogy of the Oppressed* (82) is evident in

enabling approaches. Freire's theory of cultural action gives *people* the fundamental role in the transformation process, their dialogue being "radically necessary to every authentic revolution" (p.96). Freire contrasts an anti-dialogical "banking concept" of education with dialogical "problem-posing" mode of education. Banking education deposits or transfers lifeless, static items of knowledge from teacher into student. Freire argues that this mode, often used in conjunction with a paternalistic social welfare apparatus, domesticates the intentionality of the oppressed majority's consciousness, leading them to "fit" unquestioningly in the world, thus serving the interests of oppressors. As a practice of domination, banking education anesthetizes and inhibits the creative power of learners and submerges their consciousness of their role "with" the world. Implicit in the concept is the assumption of a man/world dichotomy in which man is merely "in" the world as a spectator.

In contrast, the problem-posing mode of education produces critical thinking about existence in and with the world and is, hence, transformational. As a practice of freedom, it constantly unveils reality and promotes the emergence of consciousness and critical intervention to transform objective realities in the world. From being mere spectators, people become re-creators. Not empty minds, but conscious beings. The goal of education is not to integrate students into the structure of oppression, but to transform that structure so that the oppressed, who were formerly marginalized, become "beings for themselves".

In Latin America, confronted by the mainstream, it is indigenous people who are reasserting themselves. An indigenous leader stated recently: "We are concerned that indigenous people are left out of the political process determining the future of our homeland. It should be made clear that we never delegated the power (to lobby on our behalf) to the environmentalist community" (70). Another domino -- of paternalism -- is being pushed over.

Political and economic empowerment, self-determination, and human rights

Depending on the political, sociocultural, and economic situation, challenges to

the mainstream have come from dependency theorists, liberation theologians, other religious/spiritual leaders, cultural activists, ecofeminists, peace, environmental, class or caste-based, and indigenous people's movements and alliances, human rights organizations and other advocacy groups, other Marxist, rural radical, or agrarian populist groups, nonparty political formations, and nongovernmental and voluntary organizations.

The impact of these movements is causing two overarching, transformative trends in governance (70). One is towards decentralization, which strengthens indigenous people's influence over local affairs, and the other is toward internationalization, which provides means of redress especially for human rights abuses. Brief examples of related political-economic developments follow in the paragraphs below.

Indigenous uprisings are pressuring governments to establish constitutional, legal, economic, educational, and cultural conditions necessary for reconstruction of a society that respects cultural differences (118,70) and permits communities to exercise a decisive voice in decisions about local resources (289).

International support and political recognition is growing for universal human rights in developing countries, and public opinion is calling for physical and cultural protection for remaining indigenous societies, including key elders and their languages (149).

Alliances and networks are bringing together religious coalitions, land stewardship groups, food associations, and organic growers and buyers, and peace, human rights, and environmental activists. Examples include: The Peace Net, Earth First, institutes for sustainable agriculture, the Rainforest Alliance, the Rainforest Network.

Political formations are gaining strength based on holistic, spiritual, and sustainability platforms -- the Human Ecology Party, the Green Party, the Natural Law Party.

Indigenous organizations and traditional professional associations are reviving interest in traditional fields of knowledge and expertise, and conducting their own policy advocacy, for example, traditional healers associations in West Africa (277), and the All

India Ayurvedic Congress (38).

The rejuvenation of people's informal, traditional/ customary, nonstate legal systems -- such as the *lok adalat* (people's courts) in India -- is occurring on a wide scale in Asia and Africa, with purposes of de-alienating rural populations, enhancing access, self-reliance, and participation, and limiting the legitimacy of state power and authority (23).

Alternative economic systems are emerging that would abandon the almost universal adoption of centralized political, economic, and social systems. These involve developing appropriate self-help technology, patterns of trade, and political institutions that are best suited to specific traditional, cultural, and indigenous requirements, leading to a conglomeration of stable, self-governing, self-regulating, and self-supporting communities. There is now tremendous potential for putting together -- within a cultural/biodiversity framework -- the legal, policy, production, harvesting, processing, and distributional mechanisms for traditional medicinal products. Durning provides a glimpse of the potential for this kind of alternative trading (70). He notes:

Alternative traders, organizations committed to cultural survival and environmental sustainability, now market millions of dollars' worth of indigenous people's products in industrialized countries...

By eliminating links from the merchandising chain, Pueblo to People, The Body Shop, and other alternative traders keep more of the product value flowing back to indigenous producers. The potential for alternative trade to grow is enormous, given the growing purchasing power of environmentally conscious consumers and the abundance of plant products hidden in indigenous lands. Mexico's forests hold an estimated 3,000 useful substances known only to Indians. Among the Quecha of lowland Ecuador, each hectare of forest yields fruits, medicinal plants, and other products worth \$1,150 per year in Ecuadorian urban markets... (p.35).

Anita Roddick's chain of six hundred "The Body Shop" franchises now trade in forty countries, and she claims that her organization's culture challenges conventional business practices of the mainstream (222).

Contrasting The Body Shop with multinationals, Roddick adds:

I prefer to describe us as global. The magic of that word is that it is responsible,

it is multi-cultural, it has an anthropological and spiritual tone. Global companies have values (p.253).

For this reason, The Body Shop uses its front windows less for product advertising than for campaigns, connecting with organizations like Greenpeace, Cultural Survival, Friends of the Earth, and Amnesty International to raise levels of public consciousness on issues such as whaling, animal testing, acid rain, the ozone layer, recycling, rainforest preservation, the survival of indigenous peoples, and human rights.

The Body Shop's social philosophy appears to pervade its trading network. One of their pamphlets records how The Body Shop launched a paper-making project in Nepal in 1988, employing mostly women and reviving a dormant traditional craft. Income generated by their sales enabled the women to buy their own factory and establish a travelling eye clinic.

However, The Body Shop's record is criticized by Hyndman (118), who, citing Posey (1990:96), alleges that the franchise gets huge gains through "commoditizing indigenous goodwill", success luring indigenous peoples into cultivating monocultures of cash crops and hastening the destruction of biological and cultural diversity, rather than encouraging sustainable natural resources and maintenance of indigenous lifestyles.

Nonetheless, what "The Body Shop" and similar developments illustrate is that it is possible to alter conventional business philosophy and practice, consumer awareness and demand, and economic policy in order to re-establish conditions more favorable to the survival of other cultures. Durning (70) summarizes the necessary conditions for traditional ecological/economic systems to persist in the modern world as: i) secure, state-enforced rights of indigenous people to their subsistence base, ii) freedom to be granted by states within which they reside for political organizing by indigenous people, iii) access for indigenous people to information, support and advice from friendly sources, and iv) new approaches to trade and intellectual property rights to give indigenous people more control over their interaction with the cash economy (p.32).

Consciousness and alternative comprehension

The belief of independence and command over the natural world by the use of sophisticated technologies is an illusion, since human and natural systems have always been interconnected, whether cultures realized it or not (31).

The most basic truth regarding our Earth-home is that all living things, in some manner, are related to each other. This fact, while mainly important as a physical principle, carries implications even of a spiritual nature -- no living thing, plant or animal, is independent -- so difficult for us to understand, living under modern conditions (188).

Fortunately, awareness of society's dependence on functioning environments is increasing in the Western World, reflected in the sustainability debate at all levels (31,p.15).

As we become aware of the limitations of some of the dominant norms and values of our society, and of the habits of mind which accompany them, we can begin to challenge those limits.. Perhaps the environmental crisis, which so many cast in terms of overpopulation, pollution, global change, is really *a crisis in the way we think* (69; emphasis added).

Doubleday notes some ways in which the dominant framework is accommodating new perspectives. In the legal area:

Collective rights, by modification of individual rights framework of procedural liberalism.

Attempts to address environmental concerns by modification of the international framework of human rights.

In science, efforts to:

Relate ideas of theoretical physics to those of eastern philosophy.

Relate ecology to the concept of the Earth as a living organism (154).

Move from a reductionist mode of thought to see the material universe as a dynamic web of interrelated events (48).

Incorporate traditional ecological knowledge in resource management science.

D'Ambrosio adds another example, the bridging of cultural anthropology and history of science in order to recognize different modes of thought which lead to different forms of science, i.e., ethnoscience (64). There are *other* structured forms of knowledge

of natural phenomena. The experimental basis is not the only basis of scientific knowledge. There are other modes of theoretical reflection. D'Ambrosio cites the recent holistic recognition of the inter-penetration of biology and culture as opening up a new arena of research on culture and scientific cognition.

Mention should also be made of feminist challenges to the hegemony of the dominant discourse (97,168).

These are all attempts to modify significantly our ways of thinking about previously accepted frameworks of knowledge, and some are elaborated upon below. Re-thinking of the human relationship with nature -- through such disciplines and methods as social ecology and "ecotechnology" (31,p.15) -- and the re-acceptance of "postpositivist" (235) subjective processes of knowing are particularly salient to the promotion of IK.

The idea of "ecotechnology" is to mimic nature, or utilize the self-organizing capacity of natural ecosystems to design human society with its natural environment -- i.e., to integrate human production and conservation patterns, infrastructure, and settlement with ecosystem processes (31). The change from dominating nature, and the concept of humans as separate from nature, to mimicking nature and utilizing its "self-organizing capacity" constitutes a revolutionary shift in thought.

Use of the term "self-organizing capacity" links this renewed conception of the human-nature relationship directly to evolving understanding of the nature of consciousness. Capra (48) and Zukav (300) both document the discovery during this century of the quantum field of physics. Understanding this field banishes a number of fundamental misconceptions previously held by modern science. Crucial areas of new awareness are (300):

The subatomic realm of "probability waves" and "tendencies to happen" are *conscious* "patterns of organic energy" with the ability to process information and act accordingly -- to "decide" (p.88).

The physical world is a web of relations (p.295).

All particles exist potentially as different combinations of other particles. This parallels ancient Chinese, Buddhist, and Hindu thought that each object in the world is not merely itself, but involves every other object and in fact *is* everything else (The Flower Garden *Sutra*, or *Avatamsaka*)(p.255).

Mass and energy (the manifest and unmanifest) are interchangeable (p.58).

Outer space is not empty, but a field in which particles spontaneously appear and then vanish without trace in an endless process of form--emptiness--form (pp258,235).

Time flows in the direction of high probability (p.239).

The past, present, and future are mathematically related. All of the past and all of the future for each individual meet at one single point, now and here -- a fundamental principle of Eastern meditation (p.144).

Reality is "virtual" in nature. What appear "real" objects actually are transient illusions resulting from limited modes of awareness (p.254).

There is no such thing as objectivity. Physics is ultimately the study of the structure of consciousness, and the universe is ultimately brought into being by participation. Reality cannot be observed without changing it. Nature is not "out there". The very process of measurement actualizes into reality a function that was previously only a probability. The universe, and us, are self-actualizing (p.102).

The total mass-energy in the universe is always the same. The physical universe is a whole which seeks balance within itself, in ways understood in terms of laws of symmetry, or the cycle of death-birth, yin/yang, the wheel of life, and *karma* in Eastern philosophies (p178).

The implications of these discoveries are profound:

The idea of a conscious universe lends support to the Gaia hypothesis that the Earth is, in a fundamental sense, "alive" (154).

The idea that events link to form webs indicates the power of the mind to mold reality, rather than the reverse. Physics becomes indistinguishable from Hindu/Buddhist philosophies of enlightenment.

The experience that out of "no-thing" can spontaneously arise "some-thing" appears related to the experiences of intuition, inspiration, and revelation (300,pp142,257).

Consciousness at the most fundamental level is a quantum process; by expanding awareness, we can experience and be aware of these processes. As, at a quantum level, the flow of time has no meaning, reports of yogis and gurus experiencing timelessness ought not to be disregarded (300p.240).

True holism is the level of consciousness in which the truth is *experienced* that each object in fact *is* everything else, that each part of physical reality is constructed of all the other parts (p.255). This notion is reflected in Storer's (251) independently arrived-at awareness that each life is intimately connected with a great many other lives... Life is a flowing stream, forever passing away and as

constantly being renewed.. The universal truth [is that] the environment that supports life extends far beyond the vision or experience of the things that live there (pp14,23).

Zukav's (300) final insight is that "we are approaching the end of science... the coming of Western civilization in its own time and own way into the higher dimensions of human experience" (p331).

The limits of "exact science" have been made known to us. Truth is beyond rationality (p330), and quantum events can be captured only by S Matrix calculations which are "a statement of unanalyzability in detail" (p267) which can never be understood, only gotten used to (p226). At the most profound level, the quantum field, or field of consciousness, can only be *experienced*, as Capra, himself a physicist, described (48):

As I sat on that beach my former experiences [of diagrams and mathematical theories] came to life; I "saw" cascades of energy coming down from outer space, in which particles were created and destroyed in rhythmic pulses; I "saw" the atoms of the elements and those of my body participating in this cosmic dance of energy; I felt its rhythm and I "heard" its sound, and at that moment I *knew* that this was the Dance of Shiva, the Lord of Dancers worshipped by the Hindus (p.11).

In search of the true wisdom, Zukav (300) refers to the twelve volumes of *Prajnaparamita sutras* of Mahayana Buddhism. These indicate that true wisdom, the "special kind that cannot be learned from books", involves "crossing over" and "bringing something to perfection" (p.258). Understanding involves passing the barrier of paradox, and with meditation, come changes in perception (p.224). When we can take the quantum leap beyond rationality (p.330) we may be enabled to experience beyond the Western world view to recognize that:

The idea that objects exist apart from events is part of the epistemological net within which we snare our particular form of experience. The idea is dear to use because we have accepted it, without question, as the basis of our reality. It profoundly influences how we see ourselves. It is the root of our inescapable sense of separateness from others and the environment (p.267).

Van Asdall states that "New Age" studies are really a misnomer since many of the "New Age" principles are derived or directly borrowed from many older bodies of

knowledge, mostly Eastern, but also some from North America (269). Some "New Age" practices and principles which parallel other traditions include:

Altered states of consciousness and insights received through union with Nature (p.38).

The interconnectedness of all (p.39).

Mass, or race, consciousness, the "hundredth monkey principle" (p.39).

The principle that form follows thought (p.40).

Belief in nature spirits and elementals (p.40).

The importance of emotional detachment for insight (p.41).

Van Asdall believes that, if form follows thought, it is possible for humanity as a whole to develop a compassion for all life and the Earth by focusing thought on the interconnectedness of all. He also points to the importance of individuals developing ways that work "for each of us.. to reach in silence a level where repatterning of previously learned and stored information occurs" -- ideally the fourth level of consciousness -- so that new solutions surface in the mind, or are seen from contact with "another segment of the space-time continuum" (p.144). According to the "theory of morphogenetic fields" if enough people learn to elevate awareness or consciousness, it will be much easier for others to do so, resulting in increased understanding and compassion, and rate of learning, which will "help to insure that our beloved home and planet Earth recuperates from abuse and affliction and enters again into a state of buoyant health."

Van Asdall's concept of individual re-patterning bears a distinct similarity to calls by Chambers for cognitive and behavioral reversals and the primacy of personal action, and to work by Argyris on experiential processes of re-programming "theories-in-use" so that professional behavior corresponds with "espoused theories" (53,13).

Cultural diversity

From being viewed as an "obstacle to progress", the role of culture is now viewed as the final explanatory variable for political and economic development (291). It is seen as critical for grassroots development (238) and vital for authentization in social work and

as a mechanism for resolving social problems (189).

Hyndman (118) observes a "growing awareness of cultural diversity" in relation to who should have rights to "natural areas." Durning (70) believes that the ultimate result of the decentralization and internationalization trends could be a world that celebrates diversity of culture and human experience while respecting as universal the kinds of common values of the UN Charter. There is growing public opinion favoring physical and cultural protection for remaining indigenous societies and their elders and languages (149).

There are several issues in this change of heart towards cultural diversity.

Firstly, cultural diversity is more than "interest group pluralism" which merely recognizes multiple centers of power in the absence of a normative view of the general public interest. It is value-goal-oriented, rather than personal-goal oriented. Its goal is to bring unity in diversity -- diverse ways of understanding and using nature so as to do no harm. As Cipolla (60) writes in the context of holistic education:

There are many, many paths leading to that very same place we are all striving to reach -- call it God, higher consciousness, self awareness... Every system has its unique method of operation... We need to share our uniqueness, our methods..

The notion of global culture that is not homogenized -- unity in diversity -- is perhaps the single most important outstanding problem that societies have to address.

Secondly, culture change is not stereotypically bad. However, ethical questions enter in considering how much to change culture, by whom, and by what means. Most social change is manipulative (288). The issue is one of biased interpretation of cultures inherent in etic perspectives, in contrast to decision-making by cultural custodians whom Weber believed should be empowered by political leaders who realize that culture needs restoring.

Thirdly, Bodley (40) notes how a culture that evolves by itself and finds in itself new solutions for new problems is *more alive* than ever (p.160). This insight is the key to the concept of cultural activism through which communities can unlock the creativity of native traditions. Kleymeyer notes that cultural expression, in all its richness and variety, is a critical instrument for generating the insights and energy needed to transform, and is

the key for mobilizing the social action that drives successful grassroots projects. Further, cultural action often starts with an archival effort to record oral history, to find an analytical framework that fits the contours of what is being lived, so that knowledge can be shared, refined, and passed on (140).

Fourthly, the reassertion of indigenous conceptions and cultural values is linked to the ability of a social group to practice its own political self-determination and economic strategies (24).

Fifthly, His Holiness Maharishi Mahesh Yogi has explained that culture is a reflection of natural law (the laws of nature) as manifest in a given locality through unique qualities of climate, topography, geology, soil, water, air, and local biodiversity. From a natural law perspective, every locality on the earth's surface is unique, and it is this that accounts for cultural as well as bio-diversity. As Maharishi has said (158,p.135):

People begin to live in accord with natural law, that is, in accordance with the culture of the land. It is natural law that maintains life everywhere and gives every nation its cultural traditions. Different cultures arise from different natural factors, such as different climatic and geographic conditions. Somewhere there are mountains, somewhere valleys, somewhere hard rocks, somewhere deserts, somewhere fertile soil, somewhere heat, somewhere snow -- all these factors underlie the culture of the people living in those lands. That is why even within small countries, habits and mannerisms change, and even accents of the same language are different from area to area. Just one mile this way and one mile that way, habits, traditions, and accents change. The people justify the differences by saying: "This is our ancestral tradition".

The word "culture" has a very, very great and profound meaning. It includes everything concerning life.

In this sense, culture expresses consciousness and may be regarded as a key to higher awareness capable of revealing what is appropriate in each situation. This understanding of culture exposes the crudity of universalistic, Western notions of economic development and culture change.

Indigenous people's resistance to assimilation into dominant societies and determination to maintain and assert cultural difference perhaps needs to be understood and respected in light of this enhanced view of culture.

Moral and spiritual consciousness

A global resurgence in spirituality and connectedness with the Earth constitutes a final element of the context for IK (92,182). Miller (171), seeing in this change the seeds of a new society, lists dozens of movements, all representing a growing awareness that we must rediscover a sense of reverence for the Earth and its life, as well as more holistic, nurturing ways of healing. An example is the Portland Earth and Spirit Council that ran a series on Interfaith Perspectives on the Environment (206).

To the Western perspective, the phenomenon of Islamic fundamentalism presents an irrational specter posing a threat to peace, stability, and progress. However, the root of Islamic activism and of fundamentalist feeling in other religions (for example, Sikh and Hindu) lies in a rebellion against their people's demoralization and feelings of irrelevance and the impotence of their knowledge (111), and against what they perceive as the desecration of their belief and value systems at the hands of Western materialist culture (183,241).

It is essentially the same yearning for purification, truth, and justice that inspires the Gandhian movement, liberation theology, the revival of native American spirituality, and the revival in Sri Lanka of the Buddhist "Disciplines" by the Sarvodayan National Heritage (155,172). For American Indians, Clarkson (51) records how:

The intense repression only spans some 150 years, and although severe, has not been sufficient to obliterate the foundations of our culture. The people entrusted to carry the songs, the prayers, the ceremonies, the medicines, and the sacred pipes have been able to bring them safely through that dark period. In the past four decades, there has been a widespread move to reclaim our culture -- the languages, the customs, the spiritual beliefs and ceremonies, and the traditional ways of healing and educating our children (p.30).

The same motive also underlies Jewish education whose aim, according to Ben Horin (27p.285) is to acquire:

...an understanding of Judaism in the light of the best available evidence and understanding of a civilization, its lasting accomplishments and its unresolved problems.

The spiritual/environmental movements also represent an awakening of consciousness to the poverty of Western civilization's relationship with Nature, and a

revival of ancient recognition that belief in a living Earth and a living cosmos were the same thing. As the Land Institute puts it (150): "the Wild West only became wild after the hairy men from the East came. Before, nature was tame." Now, urbanized society has all but lost its "life-world knowledge" and even basic "bioregional" perception of place.

Storer states that his book "The Web of Life" is "written for everyone who would learn what has largely been forgotten in our machine age -- how all living things fit together in a single pattern" (251). The nature of man's present relation with nature is:

...so far removed from the soil that he little realizes the problems involved...Man can continue to grow and destroy more distant lands...the first time a living creature can maintain the illusion of having partially escaped Nature's laws (p.x).

In the context of modern scientific crop protection, Shiva (241) describes man's relation to Nature in terms of a "war metaphor", or a "maximum kill philosophy", reductionist science failing to perceive natural balance or predict the consequences when the balance is distorted.

From the moral-spiritual reawakening are springing alternative values. Examples are:

Humanity and humanization as the end, concepts of "Being" and attaining "full human potential" as fundamental in the meaning of development (82, 45, 288).

The end of fraud and coercion, and the application of a "calculus of pain" to every model of development to mitigate human suffering during social change (28p.178).

An ethics of respect (82).

Coherence in human life based on understanding of beliefs (242).

Ethical concept of development as *improving* the resource base, compared with using it to generate quick financial return on investment (102).

Giving precedence to regenerative, interdependent, eco-adaptive alternatives and avoiding rushing through so-called transformative and modernizing modes of development (95).

Rediscovery of practical life principles commonly exemplified in viable indigenous cultures (183).

Enhanced conceptions of sustainability, as exemplified by the NIH Office of Alternative Medicine's vision (181):

A sustainable future provides for the fulfillment of human needs by placing a higher value on long-term humanistic and ecological concerns than on short-term economic and technological gain. Applied to health care, the principles of sustainability call for greater emphasis on prevention, self-care, lifestyle changes, and the combined use of proven, cost-effective natural medical and health methods with high-technology conventional medical practices.

Spiritually-based concepts of ecological accounting (216).

A return to frugality and to seeing humankind as a part of nature, rather than apart from nature, also feature as values. Among the modern spiritual/environmental movements, eco-feminists are explicit in terms of introducing spirituality in their return to a cosmology centered on Mother Earth, nature, and nurturing - meanings that the modern-scientific paradigm all but obliterated. "Slowly," writes Spretnak (246p.10):

...the part of the cosmos that is human has become aware of the vast web of life that organizes itself toward increasing complexity in an ongoing weave of novelty and continuity... To traditional native cultures, the intricately balanced relatedness of the Earth community obviously calls forth awareness and sensitivity on the part of humans... When one experiences consciousness of the exquisite interrelatedness and subtle vibratory flux of the life of the material world - a perception that extends our understanding of "sentient" beyond the animal kingdom - one is filled with awe. One has experienced immersion in ultimate value, the sacred totality... What kinds of practices will remind us of what we know, even when we encounter little but denial from modern culture? Gaian spirituality calls for "action prayers," activist engagement with those human systems that are furthering the destruction of the Earth community. Much "green" activism has been sustained by spiritual commitment.

Members of traditional, non-Western societies do not need ecofeminists to remind them that they are part of nature. Their cosmology will be explored further in the second half of this chapter.

The alternative paradigm as applied to agriculture

Although this survey has been organized under separate headings, the essence of alternative thought appears to be an integrated quality of understanding which, in turn, reflects elevated consciousness and spiritual awareness. The enhanced, holistic meaning of development is perhaps best illustrated by Macy's understanding of Sarvodayan

principles. These recognize six dimensions of development: social, economic, political, moral, cultural, and spiritual -- only the first two having been emphasized in modern development goals (155).

Alternative agriculture is a good illustration of the way in which moral, spiritual, cultural, social, economic, and political dimensions interrelate. Thus, liberation theology perceives three interdependent goals in agricultural development (24):

The goal of recovering their own culture is closely linked with the first objective (of economic liberation) because strivings for economic liberation would be oriented toward cultivation of the land and husbandry of their animals.. On rescuing their cultural values they already begin to practice their own politics, and through this practice, their own culture of organization... becomes more deeply rooted. Thus the three objectives are achieved at the same time (p16).

Indigenous agricultural development is seen as a sociocultural, political, and economic strategy for indigenous people, in a similar manner to Chief Wavely's (289) view of traditional ecological knowledge as "the cornerstone of aboriginal self-government" (p16).

Sustainable agriculture has been described as a goal rather than a set of practices (139). However, certain principles are held, especially: use of nature's diversity, no waste, conservation of moisture, and the involvement of animals (139).

The key elements of the alternative agricultural paradigm, and the ways in which it contrasts conventional agriculture, can be seen in Appendix II. Haverkort (99) summarizes the LEISA (Low External Input Sustainable Agriculture) approach as making optimal use of locally available natural and human resources, and observing four criteria of sustainability: economically feasible, ecologically sound, culturally adapted, and socially just. Use of external inputs is minimized, and has to complement local resources and meet the four criteria.

The distinction between optimizing and the productivity maximizing model is important. Industrial-style agriculture may offer high productivity under certain conditions, but an inverse relationship has been observed between diversity/stability and productivity maximization. Optimal diversity and stability, not maximum productivity, is the key to sustainable agriculture (61). This corresponds with Flora's view that

agricultural science must redefine the dependent variable to include previously dismissed externalities -- a step that involves fundamental value shifts and moral-ethical judgements (78).

The spiritual dimension of alternative agriculture is rarely explicit in the literature. One exception is Huntingdon's comparative study of the religious beliefs and attitudes to nature, and resulting orientation and success in agriculture of Hutterites, Amish, Society of Brothers, and The Move (116). Her findings suggest that ideology is as important as technology, economics, and the physical environment in understanding agricultural practices. For example, in nature Hutterites do not see God or any aesthetic value; rather they perceive nature as a threat -- "perverse, but usable." As a result, they practice large-scale, highly mechanized agriculture fully integrated into the national economy. In contrast, the Amish believe they are stewards responsible to God for caring for their segment of the natural world that they own or work. Her findings on the highly self-sufficient, conservative Amish farming system parallel Yoder's study (299).

The spiritual dimension is illustrated further by the following observations.

Contemporary alternative agriculturalists often explain the motivation that maintained their often "lonely" struggle against the dominant paradigm in terms of "spiritual change" and a "love affair with the land" (139).

A common feature of native American agriculture has been the relation between spiritual wellbeing of the group and the farming enterprise, the land being used to sustain the economic and spiritual life of a community (281).

There is a modern rediscovery underway of farming "using a direct mental contact with the Devic world and in fullest consciousness basing their work on this cooperation" (100p.166). The involvement of rituals, and "talking" with plants -- with elemental Devic beings -- and engendering productivity responses is being *experienced* in the West (234). At a recent bioregional conference in Iowa, participants formed a circle and performed a ritual expressing their sense of belonging to (rather than exploiting) the land. During the ritual, a flock of birds descended and settled in their midst (297). In Milton, New York, "Herbal and Earth Awareness" workshops are offered by the organization Green

Terrestrial. Participants are invited to "align with the Devic realm" during times of "earth change", to "learn the language of plants" by using their senses, and to allow balance and harmony to enter their lives by learning basic techniques for "working in co-creative partnership" with the spirit realm. Their notion of "gracefully dancing into earth changes" seems to resemble Zukav's description of the quantum field (300).

Awe for nature and her processes is replacing the modernist instinct to dominate. Wes Jackson, one of the contemporary pioneers of alternative agriculture in America, speaks of "consulting nature" and "farming in harmony with nature" (125). Shiva (241) captures the natural paradigm well in her description of Howard's eminence as a botanist in India in 1905. She writes:

Nature never found it necessary to design the equivalent of spraying machines and poisonous sprays.. Diseases never assume large proportions in nature.. the principle is that plants and animals can protect themselves very well... Howard made "peasants and pests" his professors.. and learned how to grow healthy crops, practically free from disease, without the slightest help from mycologists, entomologists, bacteriologists, agricultural chemists, statisticians, clearing houses of information, artificial manures, spraying machines, insecticide, fungicide, germicides, and all the other expensive paraphernalia of the modern experimental station. Howard could teach the world sustainable farming because he had the humility to learn it first from practicing peasants and from Nature herself (pp93-95).

Awe for nature means regarding soil and water as non-renewable elements of the biosphere that we have no right to destroy (241). It means:

Respect for the thousands of years required for nature to develop a foot of topsoil that modern agriculture destroys in a few decades (102,p.160).

Seeing soil as "teeming life" -- 5,600 lb/ac of bacteria, 1000 lb/ac of fungi, 80,000lb/ac of organic matter (251); as a "turmoil", a "seething foundry" in which matter and energy are in constant flux -- "radiating energy from the sun streaming into a field, cascading through an atmosphere--plant--soil continuum", a "biological factory", a "living filter", a "sponge" capable of holding one third of its bulk in water (251,102).

Regarding a forest similarly as a "feverish great organization made up of many separate, indispensable parts -- the amount of life the land can support depending on the perfection of balance the community can achieve.." (251,p.56).

Amazement at the incredible root system of a single cereal plant that can push 378

miles of roots and 6,000 miles of root hairs in four months within 2 cubic feet of soil (251,p.14).

Awe is what underlies permaculture and biodynamic agriculture. Permaculture is a philosophy of:

Working with rather than against nature, of protracted and thoughtful observation, rather than protracted and thoughtless labor, and of looking at plants and animals in all their functions, rather than treating any area as a single product system (173).

Biodynamic agriculture looks at the earthly and cosmic sources of plant life, including the impact of distant and near planets and their specific relationship to the vegetative and reproductive development of plants, mediated by earthly elements such as silica and lime. Kirschenman explained some of his own biodynamic practices, specifically the addition of preparations that enhance natural biological processes in minute quantities through homeopathic principles. Thus, on a North Dakota farm in 1993, this modern farmer uses foliar sprays of ground quartz, and buries in the field a cow's horn packed with re-composted cow manure and other ingredients, to be influenced by cosmic forces through the winter months, in time for application diluted in water in the spring. His research has shown that a biodynamic preparation enhanced root growth of millet by 50% over regular compost use (139).

Researchers at Maharishi International University have achieved similar enhanced crop production and dairy performance outcomes through the use of minute quantities of Ayurvedic preparations (252).

Koepf, a practitioner of biodynamic methods at the Michael Fields Agricultural Institute in Wisconsin, writes that in "ancient cultures - Chaldean, Egyptian.. every agricultural, social, religious, etc. aspect of life was guided by those who developed the first knowledge of astronomy." On the question of cosmic impact on agriculture, he discusses how one can "build a rational understanding of this; not necessarily a causal relation, but a relationship of correspondence which one finds by a phenomenological approach" (143). This advice parallels Zukav's conclusion that there are realms of knowledge which cannot be explained, only experienced (300).

Alternative agriculture aims at different goals from conventional agriculture, for example, emphasizing *expanding* people in agriculture and resettling rural America. Clarkson's term "convergence" (51,p.60) and the concept of "unimodal development" (133) capture the alternative possibility of a locally self-sufficient rural sector meeting local demands with local resources first, and interacting with outside markets second. Small farmers have been shown to be more efficient than large farmers in terms of total output relative to all inputs, and especially in terms of entrepreneurial talent (90).

Lovelock saw ideal agriculture as a "nation-sized garden" (154,p.253). In the indigenous perspective, agriculture is central to the search for harmony and balance in life (231) and many crops are grown for sheer enjoyment and for diversity (219). The indigenous world view is explored further in Chapter 3.

A philosophical choice

Since development is a philosophical problem, the first step in setting development strategy should be for planners to determine what they would like the country to be... Some sort of stated vision and goal statement is the foundation for development planning... [But the first stage] of clear vision is "nebulous, ethical, and difficult to visualize (243).

Each country [should] define its own project of society and future within the framework of its own material and spiritual resources (101).

Entirely different knowledge systems corresponding to different historical unfoldings are possible (91).

The "inevitability" of the Green Revolution option was built on neglecting other avenues for increased food production that are more ecological (241).

This survey of mainstream and alternative thought indicates that perhaps visualizing *is* an extremely difficult problem, especially for the mainstream. In reaction to mainstream development consequences, a number of authors present options in terms of dichotomous alternatives and a philosophical choice (183), a crossroads (69), turning point (171), or the need for a transformed definition and understanding of development (17). The dichotomies are exemplified in terms of "mainstream" and "alternative"

paradigms in Table 2.1.

The philosophical choice appears to be an unambiguous one between two very different paradigms. In agriculture, the "Farmer First" paradigm developed at IDS, Sussex in 1987 has been described as:

A scattered, small-scale, quiet, yet fundamental revolution that directly challenges the values, methods, and behavior of agricultural professionals rather than those of farmers (166,p.30).

Table 2.1 Mainstream and Alternatives: A Summary

	Mainstream	Alternative
Professional values/preferences (53)	"First"	"Last"
Mode of intervention:	Extractive	Enabling
Analysis by:	"us"	"them"
Farmers are:	"passive"	"active"
(56)		
Control by:	Outsiders	Insiders
Educational paradigm (82)	"Banking concept"	"Problem-posing"
Pedagogical theory (82)	Theory of oppressive action	Theory of revolutionary action
Agricultural paradigm (34)	Centralized Dependence Competition Domination of nature Specialization Exploitation	Decentralized Independence Community Harmony w/ nature Diversity Restraint
NGO roles (190)	Service-delivery-oriented	Struggle and advocacy oriented
NGO paradigm	Development agency	Movement
Priority sectors & sustainability goals (155)	Economic, social/ institutional, environmental	As for mainstream plus political, cultural, moral, spiritual.
Dominant sectors in society	State & market	Social, private voluntary, non-government.

Governance	Elitism	Pluralism
Management	Paternalistic control	Participative, empowering, self-determination
Dominant cultural system (40)	State	Tribe/indigenous people
Dominant legal system	State	Non-state, customary
Development leadership (196)	State-led	Human-rights-led
Development (144)	Production-centered	People-centered
Development Impact (47)	Economic	Social
Perspective on conservation (93)	Economistic	Ethical
Values (171)	Materialistic, technocratic	Life-centered, democratic
Innovation theory (128)	Technological imperative	Cultural context
Cosmology (231)	"North" Earth as machine	"South" (Hindu) Earth as living creature
Relation to nature (69)	Separateness	"Man, consciousness and spirituality all a part"
Cultural	Homogeneity Assimilation	Diversity
Culture	Obstacle to change	Celebrated for stability and grassroots activism
Mode of understanding	Reductionistic Partial Positivistic	Synthetic Holistic Post-positivistic
Problem ident. & prescription in terms of:	Etic categories	Emic perspectives
Philosophies	Realism Modernism	Idealism/ pragmatism Post-modernism

Now, just six years on, there has been another "Beyond Farmer First" conference at IDS challenging professionals with a still more radical, postmodern, post-positivist paradigm (235).

"A truly alternative agriculture must be based on a truly alternative science that articulates multiple ways of knowing" (141p.542). The words "truly", "fundamental", "major" crop up not infrequently as adjectives used to describe the nature and extent of change, or paradigm shift, that is seen as required to achieve genuinely sustainable development. Thrupp describes "major reforms at several levels and in various institutions -- ranging from local non-government grass roots organizations, to national and international R & D institutions" (258,p.16). And Flora, in support of Kloppenberg, writes of the need for "the validation of alternative values." She adds (78):

It is not at all clear that the current set of agricultural institutions are capable of the dramatic paradigm shift that Kloppenberg and many others feel is necessary. Not only must the institutions totally change *what* is produced; *how* it is produced must be drastically altered. Few, if any, in those institutions are prepared to do so... The alternative science for an alternative agriculture will come.. by necessity from new areas and new actors...reconstructed from different institutions by different people than those who claim we can reform agriculture and make it more sustainable by a little tinkering around the edges (pp94,96).

More broadly, the philosophical choice has been expressed in such terms as:

A critical philosophical and spiritual choice for indigenous leaders (183,p.14)

It is a choice between:

An insidious and growing dependency on conventionally prescribed and marketed institutions, resources and methods.... [and] building on the very best or proven indigenous values and knowledge coupled to the best forms of Western knowledge (183).

Maintain[ing] the competitive, materialistic values of the industrial age.... [and] work[ing] toward a society that is more cooperative, democratic, and ecologically sane (171).

Miller adds that a culture cannot have it both ways, and be obsessed with wealth, production, and profit, and at the same time nurture the inner life of the human being. It cannot remain enthralled by technology and its power to manipulate nature, and still hold genuine reverence for life. A culture is *either* fundamentally materialistic and

technocratic, or life-centered and democratic (171).

Much evidence -- for example, the precedents of development "revisions", and current confrontations over biodiversity conservation (70,93) and the exploitation of traditional medicine (39) -- points to the philosophical choice having the nature of a *battle*. Saravia (231) notes two contradictory and conflicting responses to the contemporary "deteriorating economic, political, social, ecological, and ethical situation". One is the emergence of ecological and civic movements -- an alternative manifestation. The other is mainstream -- the "reaffirmation of economic power of industrialized countries that can impose their conditions thanks to military and economic force" and, additionally, technological dominance guaranteed by continuing revolutions in such areas as information and bio-technology (241).

In the historical struggle of indigenous peoples and their advocates, realists assumed that the indigenous would either become extinct, or become integrated into dominant national society, while idealists espoused indigenous political and cultural integrity (40). Bodley documents how the idealist position became ignored due to a focus on "preservation and protection" and concern for salvaging data, rather than on political self-determination and concern for the inhumanity of ethnocide (p.179). This characterization by Bodley of indigenous people's struggle may capture also the philosophical context for IK now.

In the philosophical choice, Doubleday believes there are two options (69). One is a process of accommodating other traditions of knowing within the current dominant legal and scientific context. The other involves, rather than piecemeal adoption of traditional knowledge into dominant Western science or law, an "attempt to understand it as a whole." This means to "change the calculus itself" (p.51).

Doubleday is uncertain how close the new awareness, new sciences, and new legal approaches of this review's "alternatives" are engendering a paradigm shift. Her analysis is that what is prevalent is more a process of accommodation -- "finding threads within the dominant paradigm which can be used to mend the tears and produce a workable whole." However, in this, she is alert to "the conservative aspect of the dominant

paradigm of Western science [which] is opposed to considering ideas which might challenge accepted assumptions and frameworks"(p.47).

Her conclusion is that the legal concept of "Natural Law", rather than positive law, offers the common ground for the continuing evolvement of values and norms by humanity. Focusing on peoples, rather than on states, Natural Law can draw on a variety of perspectives and respectfully include non-state knowledge systems and interests. Besides its significance at state level, Natural Law can reshape values of individuals. From the perspective of Natural Law, she writes: "We have within us the capacity to change our views and our frameworks" so as to respect nature and each other (p.52).

This perspective enables Doubleday to see beyond elitism, driven by "the dominant value system of Western liberal industrial democracies", and beyond pluralism, "the inclusion of different voices and views", to "*fundamental change*" -- treating IK as *an element of a worldview*, rather than as solely instrumental knowledge or mere technology.

Both Doubleday's use of the Natural Law concept and Van Asdall's notion of consciousness (269) appear to resemble the understanding of Natural Law revealed by Maharishi Mahesh Yogi. Maharishi, himself a former physicist, has used the term Natural Law to describe both the unified field of quantum physics and the field of consciousness attained during meditation as *one and the same*. Maharishi adds (159):

The knower, the known, and the process of knowing which connects the knower with the known -- when these three aspects of knowledge are seated one within the other, that is called *Samhita*. *Samhita* is the collectedness of knower, known, and knowledge....This state of pure knowledge, where knower, known, and knowledge are in the self-referral state, is that all-powerful, immortal, infinite dynamism at the unmanifest basis of creation. All about this is Vedic Science: all about the knower, the known, and the knowledge, all about consciousness, which means consciousness in its self-referral, self-interacting state and consciousness multiplied in the infinite variety of the whole creation, that performance of nature which goes on and on eternally in all spheres of time, past, present, and future. The knowledge of this most basic principle of life, this most basic reality of matter and intelligence both together, is the science of pure knowledge, the science of *Veda* (p.27).

Enhancing Doubleday's Natural Law concept by including this Vedic perspective

results in a potentially supreme role for IK, and a supreme challenge for the mainstream. For if the modern, Western knowledge system can accommodate the alternative value system, cosmology, and *samhita* inherent in an indigenous knowledge system such as the Vedic tradition, then humankind may achieve the synthesis of a new mode of knowledge based on Natural Law and utilizing the tools of modern science. In contrast to the paternalistic, ethnocentric, limited, and "value-free" understanding of Western science, such a mode of knowledge would be perfectly in tune with the Vedic concept of Natural Law, and perfectly accommodate the diversity of human cultural meanings.

To enable this, the mainstream has to accommodate not just pieces of the alternative paradigm from an etic perspective. It has to accommodate the emic perspective itself, and become open to alternative world views and a change in the calculus.

CHAPTER 3. INDIGENOUS KNOWLEDGE AND COSMOLOGY

"Modern" awareness of IK is a sensitive issue, for, by most definitions (to be discussed below), IK has always been there. One confronts immediately an irony and a dilemma somehow typical of the postmodern era. The resources for "new ideas" tend to be found in the more "open", democratic First World. Therefore, after centuries of colonial domination and several decades advocating modernization involving Western science, technology, education, and culture change, "those same Western faces" -- for, at least in academic and development contexts, it is mostly they -- are now promoting indigenous knowledge. As one studies the IK discourse, one feels forced to remain attentive to this paradox. Is the mainstream working on another "revision" -- rediscovering traditional wisdom from a surface-level, political-economic realism in the face of environmental and biological and cultural diversity crises it itself caused? Or is there a transformation underway -- a deeper, idealistic, moral and spiritual revival that was latent, expressed by a vanguard minority including indigenous peoples, but which is now gaining momentum as a result of postmodern disillusion and "searching"?

Tension between alternative interpretations is immediately evident in the IK literature. Addressing the context of World Bank development projects, Warren advocates the case for using IK in project work as straightforward (280). Yet, equally, he is conscious of a wide range of research and policy issues involved in IK including, for example, the need for: guidelines for incorporating IK and indigenous organizations into the development project cycle; mechanisms to involve indigenous peoples and their knowledge in planning and development policies; inclusion of case studies in formal educational curricula; and the promotion of cultural diversity (286).

In the same vein, von Liebenstein et al. write that the concept of IK and its development aspects needs to be further clarified. They add, "A valid question is whether IK should be considered an autonomous concept or should be treated as an approach (strategy) linked with any topic of development" (271). Bell (26) has conceptualized the problem neatly in the title of his paper: "The Exploitation of Indigenous Knowledge or

the Indigenous Exploitation of Knowledge: Whose Use of What for What?" In their analysis of Indigenous Knowledge discourse, O'Brien and Flora observe how:

Mediated by institutions that perpetuate global and local power asymmetries, the empowering potential of indigenous knowledge may be by-passed. Instead, officials, researchers, and practitioners may utilize this knowledge for their own perceived ends, however good their intentions. In addition, there is already evidence that an indigenous knowledge approach is seen by major agencies as beneficial for integrating poorer populations into the global economy. Our analysis suggests that tensions persist among and within the writings of these authors between the desire to empower and the tendency for development to control rural populations (184).

On the future of IK, there is a continuum of opinion. On the one hand, Thrupp has warned that IK, along with previous participation approaches, could become marginalized in mainstream development for political, philosophical, and institutional reasons (258). On the other hand, a number of authors believe that IK represents the *basis* for an alternative development model (183,298), and that it is the prevailing definition and understanding of development which has to be transformed (17).

The context for IK discourse involves a merging of idealistic issues of cultural diversity and the meaning of progress, and realistic and pragmatic questions to do with the efficacy of current approaches to development. Nevertheless, although rationales for IK are based, for the most part, on mainstream concerns about development, the mainstream continues to inhibit IK and may continue to influence its enhancement.

The chapter starts by describing how IK was, followed by a brief analysis of the processes of its destruction. Given that renewed interest in IK is occurring simultaneously with disillusion with development (which has trodden heavily on IK, and whose momentum is unabated), it seems prudent, before launching into IK promotion, to be conscious of historic and current forces acting against it. These are found to be essentially the same forces that have acted to limit the effectiveness of development revisions. This implies that operationalization of IK faces essentially similar obstacles to past attempts to revise mainstream development.

Indigenous knowledge is then studied in terms of how it is being used, and what it means for whom. Analysis in these terms provides evidence that indigenous knowledge

has two fundamentally different meanings in today's world. One is the utilitarian understanding of modern culture. This sees indigenous knowledge components as useful for incorporation in the mainstream of development in pursuit of efficiency, sustainability, and similar goals. The other is the sacred understanding of indigenous peoples whose holistic perspective is only dimly perceived by modern culture.

Indigenous knowledge as it was

It would be misleading to idealize precolonial history in a romantic vision of "noble savages living in harmony with nature in Garden of Eden environments" (258,p.5). History has neither been uniformly socially harmonious nor environmentally benign as Thrupp notes in the context of the Mayans (258). Hillel describes the case of the Sumerians of ancient Mesopotamia -- perhaps the first human civilization to experience agricultural decline due to the impact of silt and salt on a large-scale irrigation system (102).

Nonetheless, agricultural systems of many ancient civilizations were sustained intact until the colonial period. Mostly, the rationality underlying traditional agriculture was misunderstood by European colonizers. But some early observers, and many recent studies, showed these systems to be complex, based on sophisticated ecological knowledge and understanding, highly efficient and productive, and inherently sustainable. Classic examples are the raised bed systems used for millennia by traditional farmers of tropical America, Asia, and Africa. Known variously in meso-America as *chinampas*, *waru waru*, and *tablones*, these were extremely effective for irrigation, drainage, soil fertility maintenance, frost control, and plant disease management. Pre-conquest, the Aztecs at Lake Texcoco had 10,000 hectares of land under *chinampas* feeding a population of 100,000 people (259).

Another millennia-old agricultural system surviving to this day is the irrigated farming system of Bali, Indonesia. Lansing and Kremer (151) observed how this system was coordinated by Hindu water temples in such a way as to perfectly distribute water supplies originating from crater lakes through 37 rivers, channels, and tunnels down the

island's terraced mountainsides. A computer simulation based on the IK system demonstrated that the islanders were practicing "state-of-the-art" resource management. The system of temples and priests operated as a management system, coordinating the irrigation and planting schedules of hundreds of scattered villages, with different groups planting at different times and several rice crops grown on each terrace each year. Water utilization, soil fertility, and total productivity of the terraces were all optimized, and the spread of plant diseases, insect pests, and rats controlled. "The most perfect watershed management" was achieved -- one of the most stable and efficient farming systems on earth (180).

Of particular interest in view of this dissertation's emphasis on Vedic culture is ancient Indian experience. Dharampal documents the sophistication and simplicity of indigenous Indian agricultural technology, noting that forty one different crops were grown annually in certain localities, and that the Indian peasant possessed the ability to vary seeds according to the needs of the soil and the season (66). Pereira cites evidence that Indian farming continued on the same land for more than two thousand years without a drop in yields, and was remarkably free of pests (197).

Recently, some 18th and 19th century village accounts, inscribed on palm-leaves, and including a 1774 British-initiated survey of 2,000 villages, were discovered at Kanchipuram, South India (18). These data show that there were villages that produced up to 12 tons of paddy/hectare, a level of productivity that "can be obtained only in the best of the Green Revolution areas of the country, with the most advanced, highly expensive, and often environmentally ruinous technologies" (ibid). Even the average productivity of 6 tons paddy/hectare was four times today's national average. The palm leaves also provide a picture of the general prosperity of the time, showing that villages managed their own affairs and contributed towards the upkeep of the cultural life of the region.

Authors such as Shiva (241) and Pereira (197) believe that the economic, social, and cultural quality of life has been *falling* in rural India over the past two centuries. As well as to cause a questioning of the meaning of progress in such a context, this evidence

should force a revision of dominant ideas about the state of indigenous skills in India before British rule, and an investigation of the processes by which IK is destroyed.

Destruction of indigenous knowledge: conscious vs. unconscious ignorance

The present conditions of the international system are making people in countries of the South poorer in economic resources, [and] also poorer in knowledge. And what is perhaps even worse, poorer in the confidence with which they could continue to create knowledge (14,p.17).

Analysis of the forces working against IK reveals the impact of essentially the same influences limiting the effectiveness of development revisions, i.e., paternalism, politics, problems of understanding, ethnocentrism, and what might be called moral ignorance.

Hobart (111) states that "claims to knowledge and the attribution of ignorance are central themes to development and remain seriously understudied" (p.3), and suggests two levels of ignorance. One is unconscious simple ignorance, nonperception, or "not to know". The other is *conscious*. To capture the nature of conscious ignorance, Hobart resurrects the verb "oblivate", which "implies an active ignoring of [others'] representations and the prosecution of one's own point of view" (p.12). Hobart continues (p.16), "[the "obliviating" level] may suggest decay and the dismantling of a complex structure, or "something more primordial...the cognitive facet of the moral term evil"..."

Professional dominance and paternalism have been a powerful force, specifically the dominance of the formal, scientific knowledge system and the expansion of development agencies. Pretty has documented the historical impact of formal agricultural institutions in eclipsing lively indigenous experimentation by farmers in England (210). Experts and administrators depend on "scientific" knowledge to legitimize their superior status, having a vested interest in despising and devaluing indigenous knowledge (164) and in "imposing a sense of dependency on the part of their rural clients" (115,p.7).

Chambers argues that biases, or "selective perception", inappropriate attitudes and behavior, and power and status differentials, of scientists and professionals vis-a-vis small farmers and the poor have led to the devaluing of indigenous technical knowledge (52).

As a result, he describes a "third culture" -- the culture of the unseen whose knowledge is unsolicited (53). Assaulted by the growing dominance of imported technologies, the Western scientific paradigm, and conventional development strategies, farmers are induced to believe that the dominant views of agrochemical salesmen, state agencies, and scientists are right (258).

The impact of professionals in "defining IK out of existence" (165) has been felt from the outset of independence. Shiva (241) describes the post-independence efforts of Indian scientists and policy-makers to work out self-reliant and ecological alternatives for the regeneration of agriculture in India, but notes that meanwhile:

Another vision of agricultural development was taking shape in American foundations and aid agencies. This vision was based not on cooperation with nature, but on its conquest...not on the intensification of nature's processes, but on the intensification of credit and purchased inputs like chemical fertilizers and pesticides...not on self-reliance, but dependence...not on diversity but uniformity. Advisors and experts came from America to shift India's agricultural research and agricultural policy from an indigenous and ecological model to an exogenous and high input one, finding, of course, partners in sections of the elite, because the new model suited their political priorities and interests (p.29).

The only group supporting [the exogenous vision] "were the younger agricultural scientists trained over the past decade in the American paradigm of agriculture" (ibid.p.31).

Warren (280) has provided examples of projects "that inadvertently ignored indigenous structures." This level of "plain ignorance" -- a problem of understanding -- is exemplified by Western understanding of customary marine tenure systems in the Pacific which has assumed that fish are an open access resource. Ruddle and Hviding (224) show this to be implausible for small-scale inshore fisheries since resource areas are often closely integrated, ecologically and conceptually, with adjacent land. Land and sea occupations seen as economically and nutritionally complementary domains, not sectorized or dichotomized along Western lines into "ownable land" and "unownable sea", but viewed as:

An integrated corporate estate.. with management systems in the aquatic domain mirroring those on land, based firmly in local tradition and customary law...

intimately bound within wider cultural systems of society (p.251).

Examples from the previous chapter demonstrate that **political-economic** influences are usually fully conscious. The impact of technology -- for example, modern drilling machines on traditional well diggers in Iran (102) -- might appear unconscious. Indeed, Hobart (111) describes the "ultimate agents of development" as "transcendental" - - various groups of humans making up "supra-human" market forces. However, he adds that only certain groups in society are well placed to know about these forces, confirming what the fields of public administration and government teach: that policy is the aggregate outcome of human interaction among *actors* in arenas and through processes in which political-economic factors play a significant role (174).

The conscious "obliviation" of IK is illustrated by the stark fact of the present era: the rate of **disappearance of cultures** from the face of the earth. Sahlins (229) has stated that when two societies come together, one of the belief systems will be destroyed. Durning predicts that half of the world's languages -- 3,000 -- will disappear within the next century, taking with them half of humankind's diversity and accumulated wisdom (70). The processes of this unprecedented cultural extinction have been graphically documented (40,51,70).

Obliviation as **anti-spirituality** is evidenced by Myrdal advocating, in his "Asian Drama", for a strong state to smother the whole way of life contained in Asian religion (178). This is echoed by Clarkson who describes the attack on indigenous spirituality and the destruction of traditional world view as a precondition to modernizing or civilizing native people (51). Durning and Gray also refer to ethnocide by missionaries (70,93).

The suppression of IK is clearly related to the sheer speed and momentum of technological change (112) that seems intrinsic to an "existing science [that] is bound to capitalism ideologically, epistemologically, and financially" (142,p.104). Already, in biotechnology literature one finds "conventional" agriculture based on high-yielding varieties and chemicals labelled "traditional technology" to distinguish it from biotechnology, referred to as "frontier technology" (Li Zhensheng and Nangju, in 253,pp58,64).

*Why indigenous knowledge?**Development applications of ethnoscience*

Simultaneous with these forces acting to inhibit and destroy IK, a modern process of rediscovery is underway. The process began roughly at the same time, in the early seventies, as critical areas of failure in the development model, such as social equity, participation, absorptive capacity, centralism, were first being officially acknowledged as problems. For the most part, IK studies have been closely related, in content and timing, to recognition of problems with development. This would apply to any area of "application", from pursuit of participation and sustainability to the current buzzword in development -- biodiversity conservation.

The resurgence of interest in IK is evident in an abstract advertising a forthcoming book which notes (287):

How widely the recognition of the value of indigenous knowledge has penetrated numerous academic disciplines and development agencies... representing the disciplines of anthropology, geography, agronomy, plant pathology, soil science, entomology, rural sociology, agricultural extension, agricultural physics, library science, agricultural education, agricultural economics, agroforestry, agroecology, ecology, linguistics, forestry, botany, veterinary medicine, fisheries, range management, and management science.

Developments in ethnoscience are responsible both for this interest among modern academic disciplines as well as for development applications. Berkes (32) documents the growing recent historical appreciation of ethnoscience and acceptance of its validity across an increasing variety of fields. Berkes uses Hardesty's (96) definition of ethnoscience as: "the study of systems of knowledge developed by a given culture to classify the objects, activities, and events of its universe." According to definitions by Meehan (167) and D'Ambrosio (64), the ethnoscience of a particular culture involves a set of concepts, propositions, and theories about the world that is unique to its social, economic, and cultural background.

Traditional ecological knowledge (TEK), or ethnoecology, is one ethnoscientific subset that focuses on conceptions of ecological relations held by a culture (32). As an exemplar of TEK, Berkes cites the Hanunoo people's detailed knowledge of local plants

and animals and their natural history in the Philippines, recognizing in one case 1,600 plant species (32).

Warren (282) notes that ethnoscience provides both the methodology for recording IK systems as well as a framework for ordering disciplines. Examples of the burgeoning field of disciplines include: ethnobotany, ethnopharmacology, ethno-agronomy, ethnoentomology, ethnoanatomy, ethnomedicine, ethnoveterinary medicine, ethnomathematics, ethnopedology, ethnozoology, ethnopsychiatry, ethno-engineering, ethnocommunications, ethnoaesthetics, and ethnoepistemology.

The practical significance of ethnoscience and its subdisciplines in terms of development applications has now been widely documented. IUCN views TEK as valuable for new biological and ecological insights, natural resource management, conservation education, protected areas, and environmental assessment (123). Warren has reviewed applications and research and policy issues: for development projects generally (280), for agriculture and rural development (285), for sustainable development (286), and for conservation of biodiversity (284). In the 1991 World Bank Discussion Paper (280), Warren records cases of indigenous knowledge of tree management, the role of indigenous organizations in decision-making for development, indigenous management of common property natural resources, ethnoveterinary medicine, and indigenous crop pest management. He also documents the role IK can play in making development projects more efficient and effective, citing literature on pastoral programs that have incorporated IK components, on the role of IK in international agricultural research, and on IK in forest management, gender issues and development, sustainable agriculture, and agricultural research and extension.

Examples of other roles for IK in development include such diverse fields as: aquaculture, livestock management, genetic resources, and agronomy, (161); animal health and disease prevention (163); soil and water conservation, cropping and water management systems, agroforestry systems, plant protection strategies (213); soil taxonomy and management (283); fisheries/marine resource management (224); management and conservation of ecologically fragile and marginal areas (10,149,298);

understanding of farmer decision-making and integrated pest management (261); uses of indigenous helping networks for social work (189); indigenous experimentation and innovation (95) and indigenous engineering, technology, manufacture, and traditional medicine (17); health service provision (38,277), pharmacological uses (248); and famine relief (272).

Ethnoscience has already had impact on projects. Warren (280) provides a number of examples of the beneficial incorporation of IK components in initial project design, and of effective revisions in approach during project implementation. One of the most significant examples was the halting of a \$54 million Asian Development Bank-funded agricultural modernization program on Bali after the effectiveness of water temple management was discovered. By the time of the discovery, the ADB project had already seriously upset the traditional system and caused damage to the environment and local biodiversity. Warren records:

...the project officials were not convinced of the role of the water temples in rice production, and proceeded to introduce new management systems with high chemical inputs. The result has been a dramatic decline in the eel, frog, and fish populations in the rice paddies; an increase in rice pests; a decline in rice production and soil fertility; and considerable confusion over water rights (p.17).

Broader goals

The emphasis in development applications is often explicitly pragmatic. For example, von Liebenstein et al. write:

Because IK relates to primary production, health, and environment, and is the basis of local-level decision-making in major sectors of social and economic life... [it] is therefore related to topics assigned high priority in contemporary development programs (271).

And George states:

Nomadic cattle breeders have a vital contribution to the Indian economy... Therefore, this is not written in a spirit of "let's-be-kind-to-the-nomads-and-find-them-something-to-do" [but] developmental pragmatism... hardheaded planning for the future [rather than] nostalgic preservation of a quaint past (86).

However pragmatic the motivation is in such examples, the change implied by the

embrace of ethnoscience is nonetheless radical. The aim is not to mitigate the adverse consequences of inappropriate strategies, but to *avoid* them by starting with local knowledge and decision-making (166). Rocheleau states that if national programs are prepared to follow the lead of rural land users, knowledge of indigenous science and users' initiative may alter national agricultural and rural development policy (221). The tables are turned. Alcorn explains how, in mobilizing the resource of ethnobotanical knowledge, there are two barriers hindering the interaction needed between rural users and specialists contracted to design development projects: status differentials, and the botanical illiteracy of development specialists (7). Now, it is the modern "experts" who are the obstacle.

Neither does the pragmatism of most development applications detract from the idealism of other visions. The range of goals envisioned by advocates for IK addresses virtually every conceivable limit of mainstream development, and thus fully spans a continuum from development "revisionism" to "alternativism". This is illustrated by the following list of goals:

Sustainability, lasting impact (7).

Reduction of burden of government intervention, regulation, and enforcement (224).

Efficiency through local resource use (261); the cheapest, most appropriate, successful means of attaining development objectives (17).

Effectiveness -- from irrigation management to famine relief -- (17,163).

Stability, diversity (61).

Self-reliant growth and development (17,231).

Habitat protection and conservation of biodiversity.

Improved problem identification, framing of questions, and hence appropriateness through enhanced participation (17,261).

Avoidance of dependence leading to underdevelopment (17).

Empowerment, enhanced local control, reduced dependence on bureaucracies (231,177).

Credibility, meaning.

Expansion of "reach" and involvement of "all" in development through ease of communication (177).

Cultural identity *per se* (231), and cultural diversity.

Reinforcement of spiritual values, perception of distinct culture, and confirmation of continuity with the past and unity with the natural world (124).

Rationales

Most rationales address "development revision" problems of paternalism, political participation, and understanding. Cultural rationales, for example, the role of culture and of cultural activism can also be seen (183). Moral and ethical rationales are also offered, particularly regarding the role of indigenous people in guiding modern society toward more sound conservation ethics (69,70).

To Saravia (231), the rationale for documenting and spreading traditional farmer knowledge is the need to reverse the trends that have favored "modern" solutions and the abandonment and erosion of traditional knowledge which, together, have caused ecological, social, cultural, and economic problems. Ethnoscience, for example, ethnobotanical knowledge, can provide theory (38), principles, facts, technologies, crops, farming systems, resource use strategies, as well as contextual information (7).

As are the goals, most rationales for IK are pragmatic. Warren states the straightforward case for IK in project work (280): "By understanding and working with indigenous knowledge and decision-making systems and indigenous organizations, participation, capacity-building and sustainability can all be enhanced in cost-effective ways" (Abstract).

Familiarity with IK improves communication between change agents and beneficiary populations (282), and thus better equips project officials to facilitate participation. Genuine engagement of IK can get beyond lip-service, and overcome previous limits of environmental impact assessment (131). Plugging into ubiquitous, "low tech.", indigenous communication channels -- such as folk media, indigenous organizations, indigenous types of formal or informal instruction, traditional forms of record-keeping, and social networks -- facilitates local participation and control, and

improves effectiveness of research and extension through helping establish a true collegial partnership between local people and outsiders (177).

Working through indigenous organizations and leadership facilitates local control and, hence, genuine devolution (174). An IK approach also most fully utilizes local resources, resulting in the cheapest, most readily available, pre-adapted, cost-effective services (17,261,163).

Effectiveness and appropriateness is achieved through better understanding. Improved understanding of the dimensions of poverty are obtained through indigenous views of poverty, for example through local perceptions of wealth differentials and culturally-established standards (44). Indigenous perspectives enable improved analysis and re-framing of problems. In the case of famine relief, victims' perceptions enabled relief agencies to see the need to build upon previously localized and self-controlled systems of survival, intervening earlier to safeguard assets and save livelihoods rather than later to save lives. The warning should sound at the point when victims shift from reversible to non-reversible asset-stripping survival strategies (272). Intervention to safeguard livelihoods reduces paternalism, vulnerability, and dependence and enhances self-determination (164).

Appropriateness is achieved by basing interventions on what is there, and through enhancing understanding by communicating through local taxonomies. Such approaches help outside "experts" to understand the goals and decision-making criteria of farmers (7,261), and, through improved information exchange, produce appropriate outcomes in socio-cultural, economic, and technological terms (177). Appropriateness is also enhanced through the incorporation into national extension of indigenous innovation and experimentation, and through farmer-to-farmer transfer of IK (95).

Another rationale for IK is its role as a model, and in providing principles, for understanding sustainability and biodiversity conservation. Titilola (261) describes IK as a reservoir of such principles for designing locally-adapted, sustainable agricultural systems. Indigenous strategies of conservative and sustainable exploitation also provide essential ecological principles for guiding modern resource development, producing

optimal resource utilization (261). Berkes et al. (31) cite TEK's contextual, holistic understanding of the environment as potentially important in developing a new science of biodiversity conservation.

Arizpe (14) expresses the cultural rationale. In the fight against poverty, mobilization and self-reliance have to be backed by confidence in what people know and have learned to do. Culture and the preservation of people's knowledge play central roles.

IK as it is

It has already been noted that the forces acting to inhibit or destroy IK are essentially the same set of influences that constrained mainstream "revisions". It is also evident that the "stock", or current practice, of IK is in constant flux -- a characteristic which is explicit in many definitions of IK (which are discussed below). The constant flux may be advantageous for some people, but the more general trend is that useful indigenous knowledge is displaced, lost, and delegitimized (258).

If an anthropologist and an ecologist, Lansing and Kremer, had not studied the temple system of irrigation management on Bali, within the space of perhaps a decade that management system might well have been virtually destroyed by the disruption of "development". Indigenous knowledge would have been destroyed.

That story took place during the past five years. Countless similar stories must have taken place over the past few decades. Childhood spent by a generation of children in an African refugee camp is sufficient to wipe out a culture's traditional knowledge of transhumance. Breakdowns in inter-generational communication have a disastrous effect on culture (177).

Indigenous knowledge has limitations and shortcomings *especially in disrupted situations* (99). If, as many claim, IK is valuable for human needs and progress, but its efficacy is limited by disruption (if not outright obliteration), this raises the problem of moderating, if not reversing, the trends causing the disruption. Abbott (1) has raised several questions in this regard. Do IK systems break down because one or more pieces

of the system are missing? Or because their entire context is changed? If systems, like the Aztec *chinampas*, were highly productive and sustainable, can elements of context for their re-introduction be re-established today? In the words of Durning (70), can favorable conditions for IK be re-established?

Perhaps the salient question is: *Which* elements of original context can be replicated? Abbott does not doubt that *chinampas* could be made to work again technically, in terms of engineering and agronomy. But more problematic is the question of cultural and institutional change that has occurred during the past half millennium (1).

Mazur once commented: "If there is such a thing as "pure" IK, that is the key to operationalizing it" (165). A most important issue in the re-discovery and promotion of IK seems to be the question of what, exactly, is being worked with? And is that different from what is being sought? Is IK essentially *current local practice*? Or is *indigenous knowledge* even being practiced at all?

As is discussed below, several definitions of IK are based on an ethnoscientific framework, and, hence, view IK in terms of culture. The problem with defining IK in terms of culture is that culture is generally understood relativistically, and within a framework that allows for constant, dynamic culture change. This raises the question as to whether defining IK in terms of culture provides the most progressive, humanizing understanding of IK when a culture, even if not in the process of extinction, may be "deteriorating", distorted under the suppressive or repressive influence of a modernizing or totalitarian state? Cultures are not necessarily progressive. As Nancy Naples put it recently, "cultures are messed up" (179).

In this light, Abbott's questions of whether essential pieces of IK are missing, or whether elements of context have become lost take on added significance. Is the world content with culture as it is, and therefore with working with IK as it is -- with current local practice? Or should an attempt be made to identify and retrieve what has been lost? Perhaps it is significant to mention here that in the Vedic perspective, the present era is classified as *Kali Yuga*, an era characterized by opposition to truth and purity in which knowledge is lost or misinterpreted (187). As mentioned earlier, the Vedic perspective

also sees culture not in relativistic terms, but in terms of natural law, or *dharma* (158). From that perspective, "IK as it is" is perhaps not what the world should be looking for.

A further question is: who decides what is missing, or lost? Questions of who gets to decide, of whose knowledge counts, involve issues of power (80).

In the rediscovery and promotion of IK, therefore, key issues appear to involve consciousness, and politics.

Defining and understanding indigenous knowledge

Terminological debate

A number of different terms are in use covering the broad area of IK, and it is appropriate to understand different meanings they convey and also to clarify what is to be understood by "IK" for the purposes of this study. The approach here will bear in mind that philosophy teaches us to be suspicious of all-purpose definitions. Therefore, the emphasis here will be less on what IK means, than on how the term is used by whom and what it means for whom.

Thrupp's paper illustrates well the terminological problem. At various points in one paper, Thrupp slips between the terms traditional knowledge, local knowledge, indigenous knowledge, culture-based knowledge, and experience-based knowledge. Nonetheless, in order to avoid "semantic controversies", she selects "local knowledge" as the title of her paper. "For lack of a better term", she uses LK broadly to express local knowledge, indigenous skills, traditional knowledge, and ethnoscience (258).

Some other terms in use include: farmers' knowledge (83); native science (62); village science, folk science, people's science, indigenous technical knowledge, and rural people's knowledge (53).

Certain terms denote subfields of knowledge, for example, folk ecology, community environmental knowledge, traditional ecological knowledge (TEK), native environmental knowledge (32), and indigenous ecological knowledge (149) all refer to traditional, native, indigenous, folk, or community knowledge of natural ecosystems and the environment.

The chief concern here, however, is to investigate what significance, if any, there is in the different adjectives -- particularly the adjectives indigenous, traditional, and local.

In the context of the subject of indigenous knowledge, the word "*indigenous*" is used in two main, and somewhat contradictory, ways. One approximates to the primary dictionary definition of indigenous, i.e., "occurring or living naturally in an area; not introduced; native" (175). A second dictionary meaning, "intrinsic, innate", is less emphasized in the IK literature.

The second way the word indigenous is understood has been mentioned above, and that is by reference to culture. Hence, one widely accepted definition of IK is offered by Warren (280) as: "the local knowledge unique to a given society or culture."

If culture is regarded as intrinsic, innate, and natural to an area, the two senses in which "indigenous" is used achieve closure in a manner resembling the Natural Law framework (cf. page 46). IK then becomes the knowledge of a given culture that has co-evolved with the local environment (258) through knowledge and understanding of the local forces of nature. Interestingly, as is discussed below, this relationship between culture and environment is very prominent in concepts of traditional/indigenous ecological knowledge.

However, in contexts of environmental deterioration (often; perhaps usually, accompanied by social and cultural change, for example, through migration), the IK "developed over time in dynamic equilibrium with the environment" (278) does indeed begin to exhibit shortcomings and to become modified or destroyed. Such modification could be regarded as continued "dynamic equilibrium with the environment", but, equally, it could be construed as a process of destruction of both culture and knowledge that was indigenous.

As noted earlier, the cultural definition binds IK not so much to anything innate or intrinsic to an area, as to the concept of dynamic culture change. In one sense, this implies that IK never dies. It is "always there" by definition, regardless of culture change, so long as a given society exists.

But in another sense, in a changing cultural, socio-economic, and technological context, what was "indigenous" in the sense of native and not-introduced becomes constantly modified and mixed with external ideas and technologies. As Thrupp states, in today's wide political-economic context, it is rare to find isolated groups (258). Fujisaka also questions whether IK is still IK after farmer-to-farmer exchange or "transfer to another island" (83).

For this reason, Chambers (53) rejects the term indigenous, arguing that it implies originating from and naturally produced in an area, yet rural people's knowledge is also added to, influenced by, and destroyed by knowledge from outside the area. This is a concern also for Mazur and Titilola (166). Their selection of "local knowledge systems" and rejection of the term "indigenous" is based on their logic that, while "indigenous" has recently replaced "traditional" in social science research literature, the term "local knowledge systems" is preferred to reflect the extreme unlikelihood that any farming system is perfectly indigenous, i.e., remains wholly uninfluenced by methods and techniques originating outside that system.

Essentially, what these authors are stating is that IK is *not* "always there" by definition, but, perhaps more to the point, tends to become lost and destroyed over time.

Another ambiguity involved in the term "indigenous" concerns the antiquity of IK. Most definitions of IK measure its antiquity in terms of hundreds (120), or even thousands (51), of years, or certainly in terms of "generations" of accumulated experience or wisdom (9,73).

However, as is clear from the preceding discussion, if IK is also viewed as dynamically changing, then the possibility of very recent, even modern, "indigenized" ideas and technologies, including locally-developed or adopted "appropriate technology" such as small-scale solar-powered irrigation pumps, has to be admitted into the concept of indigenous (99). As Fisher puts it, indigenous can be native-born without being long established (76).

Field (75) points to further semantic problems with the term "indigenous" in the Latin American context. There, ambiguity exists over whether "indigenous" refers only to

the knowledge of the original continental inhabitants -- indigenous people. Also, perceptions exist that the term carries pejorative value judgements.

On the question of whose knowledge "indigenous" refers to, terminology is usually related to purpose. Thus, "indigenous" may connote the phenomenon of indigenous peoples' "movement" (93). Alternatively, Doubleday applies the term, with a broad purpose, to knowledge of ethnic groups, minorities, tribals, or indigenous peoples (69). With primarily farming practices in mind, Altieri refers simply to "local people" (9), and Chambers to "rural people" (53). Berkes, interested in traditional ecological knowledge, uses the phrase "ecosystem people" to denote societies with an historic continuity of resource use, many of whom are indigenous or tribal (32). Field (75) believes that from a socio-historical perspective, *mestizo* farmers -- descendants of Spanish immigrants -- generated "local knowledge", but, in effect, exterminated IK by killing many native populations.

Sensitivity to pejorative interpretation influences several authors. For example, IK may be rejected by some analysts as the word "indigenous" is usually associated with "tradition-based" knowledge among small native/indigenous groups, such as Indians or tribes, which some see as a pejorative (258).

Similarly, Warren (282) has explained his choice of avoiding the term "traditional" due to its connoting "simple, static societies waiting for Euro-American modernization." "Traditional" implies antiquity "based on an order, code, or practice accepted from the past" (Webster's Third New International Dictionary 1981). Berkes notes that many scholars prefer to avoid using the term "traditional" due to its implying cultural continuity while in fact societies keep changing (32).

One other ambiguity over the terms traditional and indigenous is that to different authors either of the terms can be taken to mean "local". Thus, to Fisher "indigenous" means "local" -- local systems generated by internal initiative within a local community, as opposed to externally-sponsored efforts of outside agencies (76). By the same token, he adds, traditional practice is not necessarily indigenous. However, to Haverkort "traditional" means "local", and indigenous may include more recent, outside experience

(99).

For these kinds of reasons, some authors avoid both terms -- indigenous and traditional -- preferring, in the main, the term "local knowledge". Chambers' in his argument for the alternative term "rural people's knowledge", reviews some problems with a number of terms (53). The term *people's science*, he observes, has been used to denote not only the knowledge system of a group of rural people, but *modern science for the people*. *Ethnoscience* can describe indigenous knowledge systems themselves, but also the methodology for eliciting, translating, and interpreting the knowledge system of a particular culture. One author has included Western science as one among many ethnosciences.

Local knowledge, Chambers writes, is tempting for its simplicity but may refer to knowledge of a local environment, rather than to the knowledge of people existing as a system of concepts, beliefs, and ways of learning.

Chambers recognizes that the literature on IK and indigenous technical knowledge (ITK) has served to emphasize the separateness, sophistication, and validity of the knowledge of groups of rural people, and that the "technical" in ITK also has a healthy effect in emphasizing the practical nature of much of this knowledge.

Chambers adopts "rural people's knowledge" as a most inclusive term. He argues that "rural" includes the whole range of farmers, from those fully integrated into a market system to much more autonomous swiddeners; "people's" emphasizes the location of the knowledge, i.e., in people, and rarely on paper; and "knowledge" refers to "the whole system of knowledge, including concepts, beliefs and perceptions, the stock of knowledge, and the processes whereby it is acquired, augmented, stored, and transmitted" (p.83).

Thrupp's broad meaning of "local knowledge" is very close to Chambers' meaning of "rural people's knowledge" in the sense of denoting a whole system of knowledge together with its own ethno-epistemology. And this is essentially how Mazur and Titilola elaborate their meaning of "local knowledge systems", citing Thrupp's observation that LKS contain elements that address *what* (crops, techniques, and

activities) and *why* (epistemologies, principles, and knowledge systems).

To Kloppenberg, the designation "local" is of critical importance. To him, "local" means distinguishing this form of knowledge from the global, external system of reductionist, modern scientific knowledge. He notes how a wide variety of analysts from the phenomenologist philosophers to contemporary anthropologists see an epistemic distinction between such paired concepts as: "tacit knowledge/scientific knowledge", "life-world knowledge/scientific knowledge", "craft knowledge or working knowledge/scientific knowledge", "practical labor/science", and "folk wisdom/processed knowledge" (141).

To Kloppenberg, Sandra Harding's curious coincidence of Feminine and African morality is no coincidence. Indigenous people and feminists both possess life-world knowledge. Kloppenberg sees such knowledge as intrinsically local in nature because the practical, sensuous, personal labor of such people [as blacksmiths in Nairobi, shamans in Peru, hog farmers in Iowa] is always controlled by full regard for the timely and local features of the environment within which it takes place.

Consensus

The following conclusions can be drawn from the above semantic argument.

The terminological debate appears to reflect diversity of interests, sectors, disciplines, and ideological perspective, some of which can be regarded as competitive. Taylor points out that for interpretation, in the sense relevant to hermeneutics, there must be the notion of a *subject* for whom meanings are (254). In the IK discourse, the notion of subjectivity divides most noticeably between mainstream as subject and indigenous people as subject. Where indigenous people are explicitly the subject, there is less hesitancy to use terms like "indigenous" and "traditional". As indigenous perspectives are discussed (below), reasons for this become more evident, because the focus becomes less on IK practices, and more on cultural worth and cosmology.

The problem of labeling "other" knowledge seems, thus, to reflect a difficulty mostly Western scholars experience in articulating its source in alternative

epistemologies. There is hesitancy to call it "traditional" because of the pejorative label our dominant science has given to this concept. Yet, the "other" knowledge of this discourse is, by definition, traditional in the sense of being a living, often oral, knowledge tradition. Some hesitate to call it "indigenous" because our dominant system of science and technology has reached almost every extremity of the globe and rendered anything that was indigenous no longer "pure". Yet, on close observation, the "other" knowledge is being defined holistically as knowledge that is, unlike science, *not* partial, but complete, finely tuned, and intrinsic to locality, i.e., indigenous. While the word "indigenous" is rejected, the term "local" is being stretched to encompass systemic meanings far beyond its obvious connotation. There is a sense almost of a quandary here. What is being defined and sought appears to imply something "pure". Yet, just as Indigenous People are being celebrated at the time of their virtual extinction, the indigenous knowledge of this quest is also assumed to be extinct, so other labels are substituted that seem more practical.

A second, related, conclusion is that terminology and definition is perhaps less important than characterization of phenomena represented by the indigenous "movement" (93). In some senses, the IK-TK-LK phenomenon could be criticized for "loose reasoning" similar to Eckaus' (71) critique of Appropriate Technology. However, IK/LK can equally be regarded not as a loose, but as an evolving, dynamic concept with a meaning that shifts as the rich, apparent endlessness of IK is uncovered, a process that has been likened to peeling back "layers of an onion", and as the indigenous movement spreads, gaining meaning and momentum (93).

Chambers has also suggested that what matters in an evolving concept like IK (which he likens to the way in which other concepts, like FPR, are evolving), is less the question of precise definition, and more the question of what cosmology the "other" knowledge represents (58).

Following from this point, a third conclusion is that while politically and cognitively the concept is evolving and dynamic, there is another sense, or element, of IK which is unchanging and eternal. This could be termed the cosmology, or

holistic/spiritual consciousness dimension.

Recognition of this dimension of IK challenges the notion that IK is virtually extinct, and that the realist approach to *current local practice*, or "local knowledge", is all that is left. Kloppenberg, struggling with the meaning of the "locality" of other knowledge, introduces an activist body of work which focuses on "understanding the production and reproduction of local knowledge as live tradition" (141,p.538).

This dimension is widely implied, but not universally incorporated in many views of IK. Nevertheless, alluding to alternative epistemologies, cosmologies, world views, values, and beliefs acknowledges that "other" knowers and processes of knowing, and ways of understanding and being in the world exist. The problem is that the knowledge may be based on unique epistemologies, philosophies, intuitions, and principles, which differ from modern scientific tenets. In some cultures, the insights are tied to mystical or religious beliefs, or ideas about spirits or ancestral ghosts - which are usually incomprehensible to Western scientists (258). In other words, even as we, the "observers", the postmodern "us", write scholarly articles about the "other" knowledge and the epistemologies of the "observed", we fail to permit our consciousness to acknowledge, let alone experience, other realities and realms of knowing.

This cosmological dimension of IK is discussed more fully later.

Finally, there is the distinction already noted between "other" knowledge systems and the international, scientific knowledge system.

Consensus can only be said to prevail almost unanimously in relation to this last distinction, and, even here, the view has been expressed that Western, scientific knowledge is but one among many socially-constructed ethnosciences.

Although modern knowledge and understanding of the holistic/spiritual cosmological dimension of IK is limited, there is nonetheless very wide consensus on its existence. That IK is multi-dimensional and systematic is generally agreed.

Beyond these two areas of consensus, differences in interest and perception intervene. These may limit the focus on IK to less than its holistic totality, and away from its cosmology, and also away from perspectives allied with indigenous movement.

Essentially, people focus on dimensions of IK that they are comfortable with.

The remainder of this chapter is structured by this pattern of understanding, with the discussion centered around: i) what distinguishes IK from the global knowledge system -- primarily questions to do with admissible processes of knowing, holism, and multi-dimensionality, and ii) indigenous perspectives on IK, focusing especially on indigenous cosmology and consciousness. By way of conclusion, the discussion at the end of the chapter turns to the politics of IK, focusing especially on the issue of incorporating components versus accommodating indigenous cosmology and privileging indigenous, or emic, perspectives on, and control of, IK promotion.

From this point onwards, the generic term "IK" is used, except while citing other authors' use of competing terms, or when referring to subfields like TEK.

Distinguishing characteristics of IK

Berkes observes that while IK, like Western scientific knowledge, is the result of an intellectual process of making sense of the natural world, it differs somewhat from scientific knowledge in a number of substantive ways (32):

More restricted geographical scale of observation.

Greater reliance on qualitative information.

Lack of built-in drive to accumulate more and more facts.

Slower speed of accumulation of facts.

More reliance on trial and error than on systematic experimentation.

Limited scope for verification of prediction.

Lack of interest in general principles or theory-building.

Berkes adds that a number of additional characteristics of indigenous knowledge systems are suggested by detailed studies of TEK in native and indigenous cultures and among tribal peoples. Those studies suggest that IK differs from scientific knowledge also in (p.3ff):

Being moral, spiritual, intuitive, and holistic (as opposed to being supposedly value-free, mechanistic, rational, and reductionist).

Having a large social context which includes: symbolic meaning through oral history, place names and spiritual relations; a distinct cosmology or world view, and a conception of the environment that is different from that of Western science of which ecology is a part; and relations based on reciprocity and obligations towards both community members and other non-human beings.

Having an absence of any aim to control nature.

Individual identity not being distinct from the surrounding world.

There being no separation of mind from matter.

Being an integrated system of knowledge, practices, and beliefs.

Being based on diachronic data, as opposed to synchronic or short time-series data over a large area -- a strength of IK lying in the long time-series of observations on particular local and regional ecosystems.

Berkes' characterization of IK systems needs only a little elaboration with points made by other authors on what is distinctive about indigenous ways of knowing.

Processes of knowing

The main processes of knowing mentioned in the IK literature are: scientific experimentation, trial and error, interaction with the environment, intuition, and the realm of knowing variously described as religious, mythical, magical, or supernatural.

Although Berkes emphasizes the trial and error rather than the systematic experimental aspect of IK (32), a number of authors do stress the scientific validity of "indigenous experimentation", and point to its useful application especially in agronomic and farming systems research and extension. In Bhutan, Gupta and Urma (95,p.4) describe a dynamic experimental and innovation process which they characterize as "a culture of innovation", providing examples from as diverse fields as architecture, bridge building, and canal construction to textiles. Rajasekaran (213), in a literature review, refers to IK being acquired through informal experimentation, and proceeds to elaborate a model for incorporating IK into the formal agricultural research-extension system. A number of authors advocate for mainstream acceptance of indigenous knowledge practitioners being treated as experts in their own right in an equal collegiate relationship with Western-trained scientists.

This said, however, the trial and error experience of "people who live by results" is the mode of knowing authors most frequently cite.

Clarkson creates an interesting link between this mode of trial and error and the next process of knowing, interaction with the environment, pointing out that the years of trial and error, hunger, and hardship contribute to spirituality and a respect for the Earth (51). As Capra puts it: "Intuitive wisdom is a characteristic of traditional non-literate cultures.. in whom life was organized around a highly refined awareness of the environment" (48,p.41).

Practically all literature on IK refers to something like intimate understanding of, direct contact with, interaction by culture with, or dynamic equilibrium with, the environment (9,278,32,120,213). Like Clarkson, Gupta and Urma also notice the way that constant interaction with the natural environment produces an intuition for eco-adaptive resource use strategies (95). In addition, they attribute the religious basis of IK in the Bhutanese context as responsible for a respect for all life and thereby a Buddhist "conservation ethic".

However, in their paper they do not delve deeply into the nature of the linkage between trial and error experience, intuition, and religious ethic. Perhaps this reflects what Berkes et al.(31) see as the "intermingling" of knowledge, belief, and practice which makes tracing linkages difficult. As they state (p.6):

What cannot be demonstrated is that the practices have really flowed from the IK especially as they are often implemented on grounds that are not "rational" in the modern sense, involving arbitrary social conventions and belief in supernatural forces.

Although Hobart (111) rejects notions of IK being "mysteriously in touch with nature", there is wide acceptance by many authors of rural people's ability to use a wider range of experience and more human senses than scientists (53), and of their "many kinds of insights, wisdom, and perception" (99). As an example, Thrupp notes that lunar cycles are used cross-culturally in many parts of the world to synchronize farming, fishing, and cultural practices including pruning, planting, and harvesting, and she mentions scientific explanations of lunar effects in terms of changes in gravitational pull (258).

Describing Brunei Malay ethno-veterinary practices, Kimball refers to a ceaseless interaction occurring between the minutiae of daily life and the concept of the cosmos (138). Religious cosmology is the basis for traditional practice.

Berkes et al. interpret studies of Cree cosmology to produce a definition of IK that emphasizes this cosmological characteristic (30). IK is:

The cumulative body of knowledge and beliefs handed down through generations by cultural transmission, about the relation of living beings (including humans) with one another and with their environment.

Colorado's analysis of native science helps explain their definition (62).

Native science refers to a body of knowledge that is ideally a holistic, religious perspective grounded in information that is observed with a method that may be called moral empiricism. That is, the cosmos has a unity and integrity that is creator-given, and it is the task of humans to discipline their minds and actions to recognize and understand the workings of the natural processes that we may see around us (Cited in 31,p.22).

In this cosmology, writes Deloria (cited in 62,pp51-52):

Power and place are dominant concepts -- power being the living energy that inhabits and/or composes the universe, and place being the relationship of things to each other ... put into a simple equation: power and place produce personality. This equation simply means that the universe is alive, but it also contains within it the very important suggestion that the universe is personal and, therefore, must be approached in a very personal manner ... The broader idea of relationship, in a universe very personal and particular, suggests that all relationships have a moral content. For that reason, Indian knowledge of the universe was never separated from the other sacred knowledge about ultimate spiritual realities.

Obeyesekere explains the nature of intuitive and inspirational knowledge in Buddhism and Hinduism, clearly identifying "inspirational revelatory thought" and spirit possession as modes of knowing alongside other forms of cognition such as metaphysical rationality and the theory of *Ayurveda*. He stresses that all South Asian paradigms are anchored to a metaphysical base grounded in religious belief systems which do not change (182).

Indigenous knowledge as a system

Although Hobart claims that IK is not systematic (111), all other literature surveyed acknowledges that IK covers the whole range of human experience (17) -- from social organization, production organization, festivals, music, religion, technical aspects of cultivation of local species and varieties, management of herds, pasture development, plague and disease control, human health, and climate prediction (231), to knowledge of natural phenomena and appropriate technology (120) -- and that it therefore amounts to:

A systematic body of knowledge (213).

A whole system of knowledge, including concepts, beliefs, and perceptions, the stock of knowledge, and processes whereby knowledge is acquired, augmented, stored, and transmitted (53,p.83).

Examples of other characterizations of IK as a system can be given:

IK is essentially holistic (111), [with] a general capacity to integrate multiple knowledge disciplines (183).

IK is indivisible from cosmological totality, and based on a holistic vision of life (51).

Traditional knowledge is an integrated system of knowledge, practices, and beliefs (32).

IK is far more than merely what is reflected in technical methods...it also entails many insights, perceptions, and intuitions [or] "folk wisdom" [which] is usually integrated with belief systems and cultural norms, and expressed in traditions and myths (217).

IK is "multidimensional (99).

IK does not involve practice without theory, but involves an analytical level -- cognitive ways of classifying, and explaining causes and meaning, as well as the operational level (166).

Doubleday (69) explains that TEK represents:

A collective understanding attained over long periods of time, in particular places, of the relationship between a community and the Earth. [It] encompasses spiritual, cultural and social aspects as well as substantive and procedural ecological knowledge. [It] may also include customary rules and laws, rooted in the values and norms of the community to which it belongs.

The importance of underlying theory has been stressed especially in relation to

traditional medicine (38), ecological theory, or understanding of nature and the environment, involved in TEK (32), and knowledge of agroforestry systems (73).

Warren (282) has represented IK systems in terms of a number of inter-related components including the indigenous knowledge itself, indigenous decision making, indigenous organization, and indigenous experimentation and innovation, all in a circular flow relationship facilitated by indigenous modes of communication. This can be diagrammatically represented as shown in Figure 3.1.

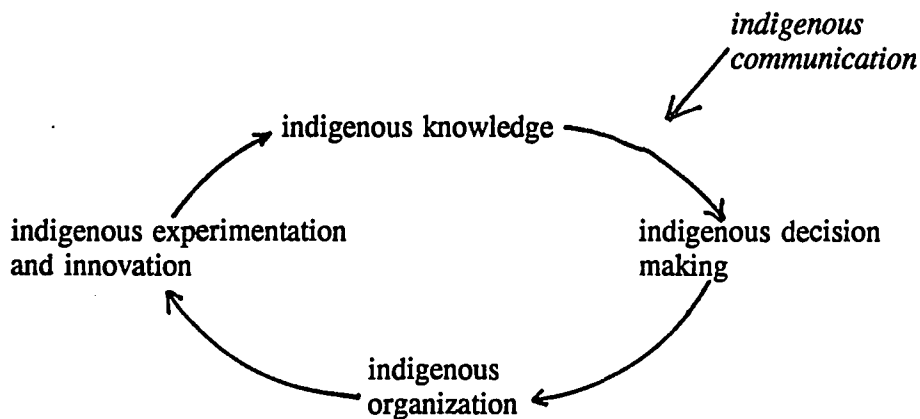


Figure 3.1 Warren's portrayal of an indigenous knowledge system

Ruddle (225) has studied the area of indigenous communication, and found it to involve highly systematic formal and informal educational processes.

Berkes et al. (30) represent an IK system in a way that reflects the importance they attach to the cosmological dimension. Their diagram portrays IK in terms more akin to the "layers of an onion" notion, with levels of knowledge structured or embedded in layers (Figure 3.2).

Both representations of Warren and Berkes et al. illustrate the interconnectedness of various elements or dimensions of IK. However, it is equally evident in the discussion that follows that IK systems can be treated either holistically as an inter-connected system, or component-wise should interests motivate a focus on any particular dimension.

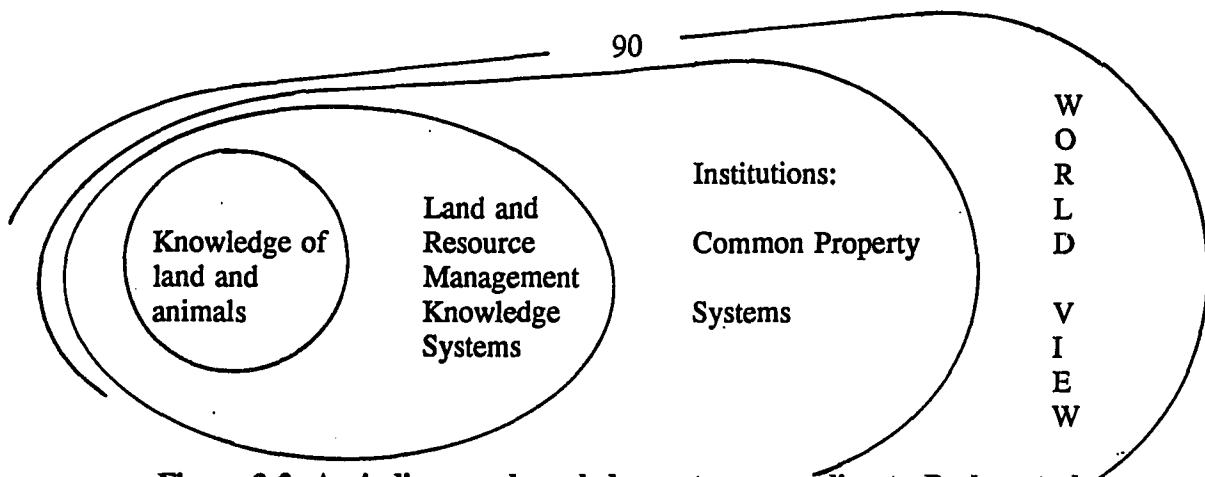


Figure 3.2 An indigenous knowledge system according to Berkes et al.

Criteria for IK definition

One might agree with Mathias-Mundy et al. (162) when they state that IK is easier characterized than defined. Nevertheless, various approaches to definition have been attempted that focus on different defining criteria of IK. Some of the main criteria or attributes involve:

The identity of holders of IK, for example:

- A given culture or society;
- Indigenous or local people;
- A farming population.

Its holistic nature.

Its coverage or scope, i.e.,

- Cognition and technologies;
- Knowledge, skills, and technologies (9);
- Technical knowledge.

Its processes of knowing, for example:

- Trial and error;
- Many kinds of insights, wisdom, perception;
- Acquisition through the accumulation of experience, informal experiments, and intimate understanding of the environment (213);
- Experience based on traditions as well as recent experience with modern

technologies (99);

Constant refinement and modification by assimilating knowledge and strategies from surrounding communities (17).

Its purpose, for example:

A basis for development decision-making.

To enable people to manage natural resources.

As far as purpose goes, IK could conceivably be defined in terms of any of the goals and rationales reviewed earlier.

As stated earlier, the attempt is not made here to formulate an all-purpose definition. What is evident is that definition within the broad phenomenon of IK is related to purpose, field of interest, and subjectivity, as well as to theorizing about IK processes and, most importantly, observation of what practitioners in specific cultures do. Depending on these criteria, IK is defined either holistically or in terms of various of its components or attributes.

Again, there is the view that modern, Western knowledge is itself an ethnoscience determined by a unique set of social forces, and no different from indigenous knowledge in being a closed system of beliefs impervious to ostensibly contrary evidence. Equally, it can be said that just as modern knowledge is the foundation of modern social life, so IK is the foundation of indigenous social life (225).

Thus, even defining IK as "an integrated system of knowledge, practices, and beliefs" by itself is not that informative. The point about IK seems to be what the *nature* of those beliefs, knowledge, and practices is, and how that differs from those of the modern knowledge system. This is the respect in which it seems important to define or characterize IK *in its own terms*, in terms of its parent culture and cosmology.

From especially a postmodern philosophical viewpoint, the important question in IK discourse is the extent to which an indigenous perspective is evident in the discourse, one that corresponds to the traits of a culture "being investigated". For this reason, indigenous perspectives are studied more closely in the next section.

Indigenous perspectives

Thrupp (258) has argued that:

Regardless of "formalized" explanations (of conventional experimental methods and scientific reasons verifying that local knowledge is logical or effective)... peoples' own knowledge and ideas have validity in themselves, in terms of their own principles and function for the peoples' own purposes... [and are] legitimate for those cultures, independent of "proof" by scientific models and paradigms (p.10).

However, local people themselves, the rural poor, vary in their attitudes towards their own knowledge. Thrupp observes how their attitudes range from pride in traditional methods (sometimes associated with a sense of cultural integrity), and rejection of "modern" inputs promoted by foreign experts, through skepticism of foreign technologies, to shame and embarrassment about their own ideas, knowledge, and practices, and even idolization of the modern and aspiration to acquire the "newest and best" foreign ideas which are commonly advertised. Like Hobart (111) Thrupp associates the admiration of things modern and foreign with loss of confidence in indigenous knowledge and belief systems. Thrupp's comments are applied to the "rural poor", but the phenomenon appears to be related to Durning's (70) observation about oppression that indigenous people suffer "indelibly marking their own psyches, manifesting in depression and social disintegration" (p.14).

The psychological impact of modernization on holders of IK produces a typically postmodern problem of interpreting indigenous perspectives. For example, Bebbington's (24) search for "indigenous agricultural development" among Indian organizations in Ecuador reaches the conclusion that an indigenous strategy requires access to modern technology, knowledge, and resources. Partly, this reflects shame for traditional technologies and association of modern technology with progress. Also, Bebbington concludes, sustaining indigenous identity will be grounded in social, cultural, and linguistic practices whose survival will be enhanced by retaining residence on, and control of, rural land and resources. Bebbington believes that this, in turn, is facilitated by modernization.

Clearly, perspectives on the question of indigenous development strategy will vary

depending not only on whether an outsider's etic view is taken, but also on social-psychological conditions which will be expressed in insiders' emic consciousness.

In his analysis of oppression, Freire (82) interprets the psychological problem as one of "duality in inner being" in which "to be" for the oppressed is "to be like" the oppressor. The purpose of conscientization is to enable the oppressed to break out from duality and fatalism and, through deepened consciousness, to apprehend their situation as an historical reality susceptible of transformation.

Certain authors, who are themselves indigenous people, express an indigenous perspective rather different from the one Bebbington communicates. Like Freire, this indigenous perspective begins with a first step of historical reconstruction, "because the mainstream and its methods have failed us consistently in all aspects of our lives" (51,p48). Their perspective, which conforms more closely to what Thrupp describes as pride in IK associated with cultural integrity, is articulated by some "outsiders" as well, and, in terms of terminology, it is interesting to note that authors representing this perspective tend to select the terms "traditional", "indigenous", or "native" which unambiguously express this pride and integrity as well as the source and true nature of this knowledge (32,62,231). This section summarizes this indigenous perspective.

Essentially, the key characteristics of this indigenous perspective, cosmology, or world view, can be summarized as: i) certain shared, anti-consumptive, and egalitarian socio-economic traits; ii) intense attachment to native soil, and synchrony with nature, leading to iii) reverence for nature as embodiment of the Divine, and, hence, emphasis of sacred rituals and spiritual consciousness. From this consciousness arises a moral/ethical conviction of being guardians and stewards of the Earth's natural resources and guides to their use by humanity. Indigenous people also hold a conviction about the indivisibility of their culture and that it should not be controlled by outsiders (Clarkson:74).

Common socio-cultural traits

Durning notes that amid an "inexhaustible" diversity of ways of life, indigenous cultures share a number of characteristics (70). Typically, they are descendants of

original descendants of an area taken over by more powerful outsiders. They are distinct from their country's dominant group in language, culture, or religion. They think of themselves as custodians or caretakers -- not owners -- of their land and other resources, defining themselves partly by reference to their habitat. They live in, or maintain, strong ties to, a subsistence economy. Their social relations are often tribal, involving collective management of natural resources, a thick network of bonds among individuals, and group decision-making, often by consensus among elders.

Bodley (40) characterizes indigenous cultures as classless, communal or community-based, decentralized, egalitarian, small-scale, sovereign nations that live close to nature and value the defense of their land and preservation of their ecosystem above all economic interests. They rely on local natural resources, manage local ecosystems for long range sustainable use, have less incentive to elevate economic production or consumption beyond local subsistence and basic human needs, and maintain social, economic, and religious controls on fertility.

Bodley contrasts these characteristics with the "culture of consumption" of modern state societies which are class-based, centralized, and maintain extractive approaches to natural resources for short term profit of special interest groups.

Clarkson, a native American writer, explains how the clan system of Indian communities is modeled on the natural world, how native American life is structured not linearly but in circles and cycles corresponding to those in nature, how repercussions of today's activities for tomorrow -- especially thinking toward "the Seventh Generation" -- guide decision-making, and how balance of mind, body, and spirit pervades the whole system of Indian thought and concepts of well-being (51).

Common among indigenous authors is a profound disdain for the "Northern" concept of development involving "high or constant economic growth and high Gross National Product from exploitation of natural resources for the accumulation of wealth" or to satisfy "insatiable need and greed". The indigenous concept of development includes well-being of the world around each individual (51,197,231,241).

Very similar cultural traits have been observed in traditional peasant societies the

world over. Redfield (215) recorded an underlying unity in ethos, or value orientation, emphasizing an intimate and reverent attitude toward the land and ancestral ways, glorification of agricultural work over other trades, the virtue of productivity and industriousness, restraint on individual self-seeking in favor of family and community, suspicion mixed with appreciation of town life, a sober, earthy ethic, and a contentment in "being" rather than "becoming".

This stereotypical view of the "peasant view of the good life" conforms with notions of peasant moral economy (236), or "economy of affection" (117). It has been challenged by Foster's (79) "image of limited good" which saw the reality of peasant life as one of struggle, as well as by Popkin's (205) "rational peasant". However, these challenges can be interpreted as observations of peasant society undergoing culture change in the face of opening and expanding exposure to market economies. The fact of culture change does not mean that the traditional, indigenous state did, or does, not exist.

The indigenous relationship with nature

The Mesquakie author, Ray Youngbear, has written:

*I am a feather on the bright sky
 I am the blue horse that runs in the plain
 I am the fish that rolls, shining, in the water
 I am the shadow that follows the child
 I am the evening light, the lustre of meadows
 I am an eagle playing with the wind
 I am a cluster of bright beads
 I am the farthest star
 I am the cold of the dawn
 I am the roaring of the rain
 I am the glitter on the crust of the snow
 I am the long track of the moon in a lake
 I am a flame of four colors
 I am a deer standing away in the dusk
 I am a field of sumac and the pomme blanche
 I am an angle of geese in the winter sky
 I am the hunger of a young wolf
 I am the whole dream of these things*

*You see, I am alive, I am alive
 I stand in good relation to the earth
 I stand in good relation to the gods
 I stand in good relation to all that is beautiful
 I stand in good relation to the daughter of
 Tsentainte
 You see, I am alive, I am alive*

Studies of native cosmologies and TEK emphasize:

Indigenous peoples' veneration of the natural world and their aspiration to a way of life rooted in the uniqueness of a particular place (70);

A view of humans not above nature but part of a "community of beings" (31);

Respect for the Earth as a living entity or creature where all depends on all and therefore all are important (231), as opposed to its treatment as a storehouse of resources to consume (51,70).

Kibben and Bartz capture the quality of the indigenous relationship with nature as they describe a Lacondon Maya elder in the Mexican rainforest, Jose Camino Viejo, listening to a bird chirping and, as it flies away, interpreting what the bird was saying (137). In his isolated compound hidden in the forest -- "an agronomic paradise, an island of food and raw materials in a backwater of weeds and cattle and regrowth... with seventy nine different species of food and fiber crops" -- Jose defies politicians' declarations that traditional agriculture is obsolete and wasteful. His stewardship of the land is based on the belief that the earth is the source of all life, and his intricate tree garden mimics the diversity of the natural rain forest (cf. 70). The elder told Bartz:

The outsiders come into the jungle and they cut the mahogany and kill the birds and burn everything. They bring in cattle and the cattle eat the jungle. I think they hate the forest. I just plant my crops and weed them, and I watch the birds and I watch the forest to know when to plant my corn and wait for the rains to come. As for me, I guard the forest (137,p.1).

Clarkson explains that indigenous peoples' traditional knowledge is based on a holistic vision of life that is in compliance with Natural Law, adapted to the culture and ecology of each population and place, and matured over a period of time encompassing thousands of years. It provides the *basis* for agriculture, hunting, fishing, gathering, animal husbandry, food preservation and preparation, health care, education, spiritual and

psychological well-being, environmental conservation, and diverse other fields of living (51). Examples of indigenous people's attunement to local forces of nature are given by Durning (70), for example, the ability of coastal communities to predict to the hour the spawning of fish, and distinguish eighty different tidal currents. Similarly, Gupta and Urma (95) record in Bhutan how cattle and yak herders criss-crossing the mountainsides "coordinate their behavior with almost ritualistic precision through [awareness of] ecological signals and other means... Herders do not exchange messages about their movements... yet achieve non-contact to avoid disease transmission" from one herd to another.

In view of its basis in Natural Law, Clarkson believes that IK cannot be understood outside of indigenous people's relationship with the land (51). Being a body of knowledge accumulated for specific lands, and handed down over many generations, it cannot be uprooted or transferred (289).

The agrocentric culture in Peru appears to exemplify this indigenous, Natural Law-based, relationship with the land, as described by Fernandez and Vasquez (74):

Some 20,000 years ago, groups of Asian people arrived in what is now Peru... Andean culture perceives nature as if it were a living and highly sensitive animal, capable of responding positively when handled well and therefore capable of being domesticated, but also capable of responding furiously when mistreated.

The Andean man and woman see the flora, fauna, soil, and water as parts of a whole, of which they and their children are a part: "We are part of the earth". This relationship does not imply immobility but rather continuous transformation and domestication of the environment, not for the unilateral benefit of man but for the reciprocal benefit of nature and society.

Andean culture is agrocentric since the prime concern of the society is to assure adequate and sufficient food and to produce raw materials for processing. Agrocentrism means that the social organization, science, art, philosophy, religion, perceptual framework, language, and technology are all functions of the farming activities.

The Andean society seeks an integral interrelationship with its medium, as reflected in the careful organization of space and the eagerness to create beauty that benefits nature and society. For example, the construction of irrigation systems benefits the society, as it allows an increase in production but, at the same time, it benefits nature in the sense that it allows an increase in the total biomass

production, i.e., a greater quantity of life in the environment.

In a given place, on the basis of the resources provided (soil, water, flora, fauna, climate, landscape), the farmers create the type of agriculture that is possible at that site. This is given a *chacra*, a name that identifies a particular type of agriculture. The *chacra* of the *campesino* can be seen as the "concentrate" and the center of the culture. For a technician, a plot is no more than a medium for production; for the *campesino* it is the expression of its agrocentric culture which provides food, is a meeting place and a sacred place where rituals are carried out.

Reijntjes points out that indigenous folk wisdom often involves understanding of lunar and solar cycles, astrology, and meteorological and geological conditions, and, especially, a holistic world view in which farming communities believe that nature is given by a supernatural power to be handled with care (217). As a result numerous rituals accompany farming activities, and maintaining the quality of natural resources is considered vital. Farming is not merely "production", it is a way of life.

Noticeable in the Andean example is the notion of farming "enlivening" nature. This enlivening quality of indigenous stewardship of nature is exemplified also by the Kayapo of the Amazon rainforest whose methods of husbandry of the forest ecosystem have been shown to *enhance* natural biodiversity (207). Indigenous ability to enhance nature's functioning becomes clearer as sacred and spiritual dimensions of IK are discussed.

The sacred and spiritual dimension

Indigenous knowledge is essentially spiritual (93).

To indigenous people all Creation is sacred (51), the sacred and secular are inseparable (289), spirituality is the highest form of consciousness, and spiritual consciousness is the highest form of politics (51).

This sacred dimension could be regarded as a defining characteristic of indigenous culture. "Indigenous peoples all share this same understanding of Creation and the realities of survival," writes Clarkson (51). After thousands of years of cultural evolution, they have a world view of sacred responsibility. Thus, Durning states that nature is where we develop our culture and bury our dead. It is inherently valuable, revered as

embodiment of the Divine. Amid endless variety of indigenous belief, there is striking unity on the sacredness of the ecological system (70).

Indigenous spirituality is much more than some religious "component" in a cultural framework providing community sanctions to substitute for state coercion. Berkes et al. (31) observe how TEK of natural resource management is only partly social convention; partly it is religious "*belief*".

Lovelock (154,p.204) describes how he was once asked whether he "believed" -- had he "ever had a religious experience?" Not understanding what his questioner meant, imagining that he referred to some manifestation or miracle, Lovelock said "no". Later, at the time of writing his book, he realized he should have said "yes", because, as he states, "Living itself is a religious experience."

This seems to be the kind of spirituality that indigenous people refer to, and the very kind of "native wisdom mysteriously in touch with nature" that Hobart rejects as a source or basis of IK (111). However, Gray (93) records that "throughout the indigenous world, knowledge of the environment depends on contacts with the invisible spirit world" (p.43), and cites examples of spirits informing hunters in dreams, hunting, gathering, and fishing being organized through spirit contacts, and shamans contacting the spirit world for cures and advice. He admonishes environmentalists who work with indigenous peoples:

...to grasp not only the biological but spiritual aspects of knowledge -- i.e., [we are] not simply dealing with the relationship between humans and external "nature", but the relationship between the visible and the invisible spirit world.

Opoku (186,pp13,8,11,170) explains the distinctive feature of traditional African religion as lying in its being:

A way of life, [with] the purpose of... order[ing] our relationship with our fellow men and with our environment, both spiritual and physical. At the root of it is a quest for harmony between man, the spirit world, nature, and society...

Africa is so vast... yet there is a *common thread* in indigenous values, views, and experiences which show a large measure of uniformity... The unseen is as much a part of reality as that which is seen... the spiritual is as much a part of reality as the material, and there is a complementary relationship between the two, *with the spiritual being more powerful than the material*... The community [is] of the dead

as well as the living... And in nature, the similar notion that behind visible objects lie essences, or powers, which constitute the true nature of those objects...

Religion binds man to the unseen powers, and helps him form right relationships with these non-human powers...

Traditional religion is important in providing African societies with moral values which undergird relations between people in a community, and between them and their environment... It is important to study it and to discover its abiding values in a world whose moral and intellectual inadequacies are self evident, and to apprehend the truth which it represents.

The Hindu concept of *Dharma* captures at once social ordering, spiritual, and ritual dimensions of religion. As Macy (155) describes it, *Dharma* refers to both an integrated set of values, core principles, and context, and to "the law of reality" or, in Maharishi's words, "that which upholds or sustains all that is... the invincible force of nature which upholds the entire creation" (156, pp262,487). *Dharma* also subsumes daily purifying rituals, including meditative techniques, that an individual performs to clear the path for communication with the Godhead.

Dharma, or Natural Law, is thus useful in providing a framework for understanding indigenous cosmology and ritual and their application to agricultural practice, drawing together such notions as:

Harmony and equilibrium among all components of the cosmos, including the central role of agriculture in coordinating "balance for wellbeing" established and maintained through relationships not only among people, but also nature and deities (231);

The blessing of a new field representing not mere spectacle, but an inseparable part of way of life where highest value is harmony with the earth (268);

Sacred responsibility (another specific meaning of *Dharma*) arising from understanding of realities of survival -- the "basic law" [of nature] (51);

The conviction about indigenous stewardship, the instruction to "deal with all life as if it is part of ourselves" (51) that remains deeply embedded in indigenous praxis (268);

An equally ingrained sense of "the way things ought to be", and hence disdain of certain modern technologies that contravene nature, for example, battery-raising of hens (138), and certain uses of biotechnology (241).

These roles of *Dharma* expressed through religion, spirituality, and sacred ritual

can be illustrated by some examples.

The concept of domestic animal, as well as certain human, diseases being caused by evil spirits, imbalances in certain elements (known as *doshas* in Ayurveda, or yin-yang forces in classical Chinese medicine), the anger of powerful supernatural beings, transgression of taboos, punishment from deities for wrongdoing or incorrect propitiation, or cosmological turmoil (138,163). Hence the prevalence of "magico-religious" supernatural practices accompanying naturalistic ones in disease prevention and control, ranging from complex healing and protective rites to simple recitations (163).

Avoidance, worship, or respect for temple forests, sacred groves, and specific trees throughout the old world in protecting nature's diversity of biological communities and species and conserving resources (68,162,131).

Reverence attached to crop seed as a physical manifestation of blessing and favor bestowed upon people by the Divine (42); seed as sacred (241), a gift of the goddess (47).

The practice of a ceremonial cycle of sacred rites to influence the pattern of surrounding environmental and cosmic forces so that crops grow free from hazards threatening them; a "form of expression" through which the possibilities and dangers inherent in life may be contemplated and reflected upon, and perhaps also thereby transformed and deepened (42).

Buddhist ethics underpinning common property and resource management institutions in Bhutan, religion leading to a respect for life in all forms, and the role of monasteries in providing retreats for individuals "to regenerate consciousness" (95).

The powers of traditional healers, for example, the Bono of Ghana, who explain how traditional knowledge is cognized during a priest or priestess's possession by his or her deity. As the deity enters the healer's mind from the shrine carried on the healer's head, knowledge of a cure, a certain part of a forest plant, together with its necessary preparation, is revealed.

Hindu *Agama Tirtha* (religion of holy water) in which worship of Devi Danu, the water goddess who dwells in the crater lake near the peak of the Batur volcano, has been central in managing the island of Bali's irrigated farming system for the past ten centuries or so. Specifically, the role of the Jero Gde, high priest of the supreme water temple at the sacred crater lake, in coordinating the cycles of cropping and timing of operations for the whole system by consulting natural signs and prescribing appropriate rituals that mirror the flow of irrigation water, presumably in accordance with Vedic texts (the Rajapurana Ulun Danu Batur) evolved in Bali (151).

A final example which can be briefly elaborated here is shamanism. Originating in

Asia, and the basic world view and ethos of more than thirty million Amerindians today in Latin America, shamanism, according to Reichel (216), is a political and religious technique for managing societies through certain ritual performances, myths, and world-views such that a community respects the natural environment and community life as a social common good.

Reichel distinguishes two kinds of shamans: "He Who Sees All", who contextualizes information into "long term spatio-temporal analysis", and the "Curer", who treats short-term ailments of people. She describes how shamans are able to "sit and think for a night or more" about the consequences of a hunting act, "speaking in thought" with the entities dwelling within an animal, and seeking their advice about the possibility of making a transaction with an animal life. During this process, it is revealed to the shaman what form of "payment" must be rendered to the concerned entities of the natural world, establishing the "accounting" that over time ensures long-run sustainability.

Similarly, if a person plans a journey through a region and wants to know the impact of their trip, a shaman will "travel in thought" for a night or more, encountering the Plant-Animal People and spirits who are the "owners" of each micro-habitat the traveller will encounter and what risks there are in exchanging certain resources with them or in changing the land use patterns. If a shaman accompanies the traveller on the trip, he may talk aloud to these "People of Nature" and make comments about their population density, health etc. as well as point out the geographical limits of their domains.

Reichel describes shamans as being able to give "a clear lesson in ecology", calculating, by means of "internalizing the universe" through heightened consciousness, environmental fluctuations in supply and demand and relating them to human demands, and representing the biomass or ecosystems as ranked life-systems, and as "chiefdoms of Nature's People"...

As such, shamans are the accountants that keep the memory of past exchanges with Nature. In each case, there can be states of credit, debt, or balance between certain ecosystems or resources and human society (p12).

Reichel presents a fascinating account of shamanistic cosmology the complexity of

which cannot possibly be explained here. Suffice it to say that it recognizes various layers of the universe and of skies, a "cosmic river" and a "cosmic fire", a male and a female Creative partnership of generative thought and regenerative force, and an understanding of the relation between skies, climate, and universe to any land issue.

Many features of shamanistic powers are reminiscent of Zukav's and Maharishi's portrayals of the quantum field of physics and of consciousness. For example, as shamans "travel in thought" they are allowed to understand death as an exchange between life-forms in a "cosmology of exchange". The universe is internalized "as constant rituals are danced, sung, and performed... during different seasons of the year to publicly announce the ecological characteristics of a given time." The Cosmos is also represented in traditional architecture, the house being a model of, and for, the Universe. As the universe is conceived as a series of superimposed levels and each domestic unit, or roundhouse, is conceived as a compressed universe, the domestic economy is intimately related to the laws of Nature and the Universe in a manner very similar to *Sthapatya Veda*, or Vedic architecture.

Shamanistic accounting appears to perfectly exemplify and substantiate the claim of certain indigenous leaders that they can guide the world in restoring a rightful "man/nature continuum"(69). In Durning's words, indigenous peoples are guardians of the vast, little-disturbed habitats that modern societies depend upon more than they realize, and possess, in their ecological knowledge an asset of incalculable value -- a map to the biological diversity of the earth on which life depends. Encoded in indigenous languages, customs, and practices may be as much understanding of nature as is stored in all the libraries of modern science (70).

Custodians of IK

From the literature it appears that every indigenous culture possesses specialists in the diverse fields of its knowledge system, from traditional trades, to customary law and aesthetics (279), to the fields of cosmology, religious ritual, and shamanism. Communities themselves, especially their elders, are able to recognize which among their

members are most expert in particular branches of knowledge (282). Mundy and Compton (177) cite examples of indigenous experts and professionals, such as "farmer paragon" and opinion leaders, and healers, shamans, sorcerers, scribes, irrigation builders, temple priests, physicians, and leaders of clans and guilds.

Thrupp points out that in many cultures, women have particularly rich insights about certain resources, plant and tree species, livestock, and farming techniques (258). Other references in the literature to custodial roles include:

The role of elders and specialists to maintain culture through inter-generational communication (177);

The role of elders, held in high esteem "who alone had the expertise and wisdom of years and understanding of our role as indigenous people and our relation to Creation", as transmitters of stories and legends that kept alive our direct connection to the natural law (51);

The role of custodians in providing systematic traditional education (225).

Berkes et al. (30) describe the role of the Cree "okimah", the hunt leader and social/spiritual leader for a group and "steward" for natural resources management, who upholds the ethic guiding social relations and human-animal relations, supervises the sharing ethic, minimizes conflict through knowledge of land capability, and resolves disputes.

Researchers have been unaware of the perceptiveness among rural people, Thrupp believes, partly due to their biased focus on only land-owning male farmers and neglect of other members of society (258). There is now some recognition of the value of establishing a true collegial relationship with custodians of IK systems in national planning and programming, particularly in traditional medicine, and in agriculture (177). Durning cites the revival of councils of elders in Costa Rica as a means for rebuilding community cohesion (70). Macy (155) describes a similar revival through Sarvodayan organizations in Sri Lanka of Buddhist ethics and the practice of meditation, and Gupta and Urma (95) describe the value of the *dzong* monasteries in Bhutan for cultural, administrative and legal functions, and allude to the desirability of recovering "eternal principles" for guiding Bhutanese development.

Bodeker's (38) account of the role of traditional custodians in the revival of the Ayurvedic health system in India is instructive. He documents how stimulated and mobilized Indian ayurvedic physicians became as they participated in a recent process of rediscovering and revitalizing their tradition, emphasizing their concern that Ayurveda should not be viewed as traditional in the limited sense of "old", but that it should address major health concerns of contemporary society. A major source of the vigor in their approach was due to the impetus for the Ayurvedic revival coming from its traditional custodian, the custodian of the Shankaracharya tradition, Maharishi Mahesh Yogi.

As is discussed in chapter 5, there are many other branches of expertise in the Vedic tradition, including *Jyotish* experts (astrologers) and *rishis* (seers). Through highly evolved consciousness, and specifically through training in specialized yogic powers known as *sidhis*, these experts achieve clairvoyance to a remarkable degree, as well as other feats involving mind-body-spirit integration. Two examples known personally to the writer illustrate these powers.

The writer's wife's grandfather was a renowned *rishi* whose perfection of consciousness was such that he predicted the exact moment of his death a long time in advance. In Nepal, people with this ability are known as "*trikaladarshi*", able to see at once the past, present, and future. When the time approached, he advised his family not to be sad as he was merely going to leave his present bodily form to take up another. Together with my wife's uncle, he then left for a holy place of pilgrimage, Rishikesh, in India and, in a state of meditation, seated in the lotus position on the banks of the Ganges, he "left his body".

If seers can predict in advance the moment of death, and perform many other "miracles", they can certainly visualize the course and consequences of development. The writer witnessed a remarkable incident of this in New Delhi, India in the summer of 1986 when Dr B Triguna, President of the All India Ayurvedic Congress and a personal friend of the writer's father-in-law (who was an Ayurvedic physician), took the writer and his wife to meet Maharishi. We found ourselves seated on golden couches on the dais next to

Maharishi before a gathering of several thousand people, as he quietly spoke of the time "soon to come" when "Russia and America, East and West, would be on the same side". At that time, such a notion was wholly inconceivable through normal perception.

The ability of shamans to "enter" unseen dimensions of ecosystems and the spirit world of plants and animals is exactly paralleled by Ayurvedic physicians who, possessing a specific *sidhi* power, are enabled to "enter" the past, present, and future mind-body physiology of a patient and achieve precise historical and current diagnoses simply by looking at the patient's face and touching their wrist to perceive the rhythm and pattern of multiple pulses.

Such enhanced perception, and the common ability of seers to know in advance the moment of their death, belies the Western view that traditional cultures exist in keeping with natural cycles only through "an unforeseeable or catastrophic cosmology" (112). Bodeker's Ayurvedic example illustrates the potential of enabling traditional custodians to take control of policy direction and organization, and underscores the importance of incorporating "the right people" in such a revival process.

Indigenous cosmology: Essence of IK

The essence of IK, and the difference between an indigenous perspective on IK and an outsider's perspective of what might be termed local knowledge, is illustrated by attitudes of Krobo farmers in SE Ghana. Amanor (10) notices how, with shortening fallow periods and mounting weeding problems in a disrupted forest farming system, some Krobo farmers:

Channel their energies into developing knowledge of medicinal properties of fallow plants, and making herbal remedies, which carries high status... an intellectual exercise in the use of plants, which is fuelled by a historically highly developed culture of herbal use, and which carries less frustration in developing systematic thought than attempts at fallow management... Frequently, questions I asked farmers about fallow plants were met with impatient replies of "this is child's play, let me tell you about *the real knowledge*, the medical knowledge... (p.11, emphasis added).

These Krobo farmers were articulating their *indigenous* knowledge, apparently

within a cosmological framework.

The essence of indigenous cosmology, and the meaning of agriculture from an indigenous perspective, is to make the Earth "happy and fruitful" (102), and to enhance the balanced wellbeing of humanity in mind, body, and spirit, in harmony with the cosmic-spirit world underlying nature (231).

In indigenous cosmology, just as seed is imbued with sacred significance, and medicinal herbs are understood holistically and synergistically, so too are different food items understood as involving diverse qualities. Shiva observes that Green Revolution strategies are unable to make meaningful assessments of total crop yield in diverse, mixed, rotational systems, and that the notion of yield conversion into a single measure misses the distinctive functions of different crops in diet and ecosystem (241). Outsiders' observation of "eating practices" of different cultures may fail to appreciate the purposes of different food items in relation to effects on physiology. This is especially evident in Ayurvedic theory, as is discussed in chapter 5.

Bodeker (39) related an incident that occurred recently at a conference in Canada on traditional medicine which illustrates how embedded the indigenous perspective is within a sacred cosmology. A gathering of several dozen native American practitioners of traditional medicine had agreed among themselves that, in their view, there were four dimensions to health -- spiritual, emotional, mental, and physical -- and that, to create total health, all dimensions needed developing harmoniously. A very senior official from the U.S. National Institute of Health was present and stated that he did not see how their view differed from WHO's definition of health -- "WHO also emphasizes that health consists of physical, mental, and social wellbeing of individuals."

The Indians replied, "But where is the spiritual?"

An argument ensued, but the NIH representative failed to grasp the Indian view. To him, "spiritual" was subsumed within social and emotional. To the Indians, the social and emotional was so far removed from the infinite, the universal, and the spiritual that for some time they did not believe the NIH man's seriousness.

Bodeker described how, to the Indians, spiritual meant:

Our link, personally and collectively, with the universal and sacred forces that sustain us. If we lose this link, no amount of social or physical treatment will produce health. The first step to restoring health is to restore the spiritual link with the environment, the universe, and the divine.

From several years experience of policy and clinical research in Ayurveda, Bodeker has come to know that what is important about Ayurvedic herbs is not, as drug companies see, their inert chemical composition, but the way in which their ingredients express various laws of nature and divine forces. As Mazur (165) commented, "there's more to healing... there are things beyond the pharmacological components of traditional medicine."

Bodeker (39) explained how a colleague of his, Ballach, during field experience in Belize and Costa Rica, worked with one herb-gatherer/ indigenous pharmacist/ healer who said prayers to the spirit of each plant before gathering it, apologizing for and explaining his need. This indigenous professional, with some two thousand patients, understood the *devata* level of his medicines. As Bodeker explained, to this healer the preparation was not just a bundle of organic chemistry that drug companies synthesize artificially into a pill. It was a sacred, spiritual preparation.

Bodeker believes that, from an indigenous perspective, Western understanding of physiology is "the crudest expression of physiological knowledge". It completely misses the subtler level of energy flow, not to mention the level of "bliss-consciousness" that is another level of physiological functioning explicitly recognized in Ayurveda. Ayurvedic herbs and related techniques address all these levels (ibid).

Without an appreciation of these finer levels, Bodeker believes, there can be no real understanding of traditional medicine. The spiritual dimension is fundamental. The NIH man may think the "holistic" perspective is very trendy, but, for indigenous cultures, holism involves spirituality -- talking to the spirits of plants, preparing herbs accompanied by further ritual, and yet more prayers and invocation of deities during patient treatment.

Subtleties of traditional medicine expose the poverty of Western positivistic thinking that reduces the finest levels of indigenous knowledge to chemistry and the

interaction of a chemical and a receptor. Bodeker described this as

The most banal level of comprehension -- a joke to the Indian North American -- so partial that they could not believe that we think it is real medicine (39).

Clarkson's emphasis on healing can perhaps be understood best from the perspective just described. Her concept of a return to "wellbeing" involves mind, body, and spirit: healing of minds from centuries of oppression, healing of bodies from abuse, and healing, *reclaiming*, of spirit, so that mind, body, and spirit become again in balance, empty of false messages, re-educated in indigenous identity (51). Clarkson compares the need for indigenous healing -- and the healing of the global community and the planet -- with the Holocaust. In a Freirean manner, she sees a need for oppressors to admit their mistakes, and the role of traditional people who still "have the teachings and the knowledge of ceremonies, rituals, and healing methods of our ancestors" (ibid.p.49).

Clarkson represents the difference between indigenous and modern world views by making the following contrasts:

Sacred versus secular, the modern world view being that the earth is not bound by any rules or "original teachings".

The Earth as gift of Creator versus resources for exploitation, removal of the religious/sacred in favor of a perception that the earth is meant for human possession and control, passive resources to be harnessed for utility.

Collective responsibility and cooperation "until the Seventh generation" versus competition and responsibility to self.

Balance and circular/cyclical thinking versus linear growth and continual expansion of "need" and unending accumulation of wealth implicit in consumer-oriented society.

Within this cosmology the meaning of development is;

As much about culture as economics... sustainable progress is inseparable from lasting stewardship of ancestral lands, continuity of language and customs, and the spiritual links forged through shared values (268).

How do indigenous cultures see the world so differently? Zukav writes of the need for modern humanity to cast off the bonds of concept and ultimately go beyond thought altogether in order to "perceive directly the inexpressible nature of undifferentiated

reality" (300,p.270). He continues:

To the unenlightened, the physical world consists of separate parts, but according to mystics from around the world, each moment of enlightenment (grace, insight, samadhi) reveals that everything -- all the separate parts of the universe -- are manifestations of the same whole. Only one reality.

Enlightenment, explains Zukav, is "a state of being", and therefore, like happiness, indescribable.

Through an emerging fusion of ontology, epistemology, and psychology researchers are beginning to understand such phenomena as how mind can influence matter, but the key problem, according to Zukav, is still language, because states of being can only be described through symbols. Quantum logic calls us back from *logos*, the realm of symbols, from trying to explain phenomena through language, to *mythos*, the realm of experience.

Zukav cites Cummings' quip about logos being "a polite word for dead but not buried imagination", and explains that one cannot communicate the spontaneous experience of mythos, but by telling others the method, one can enable others to have perhaps what Freire (82) refers to as consciousness turned in on itself -- "consciousness as consciousness of consciousness" (p.52).

From this study of indigenous cosmology, it seems that the custodians and experts of indigenous cultures the world over are peculiarly aware of Nature, and are tapping into the same thing -- Nature's organizing principles, what Reichel describes as entities and influences of the spirit world (216), or what Clarkson calls natural law (51).

A paradox of the study of IK is that IK may be best understood in the Western framework by reference to Western science, namely physics, which has as its profession the study of the laws of nature, specifically the study by quantum physics of the unified field. Seen from this perspective as well as from the indigenous perspective, IK is *not* "local" knowledge, but *knowledge of the non-local, the universal as expressed in the local*.

A number of concepts of IK are partial and lack this quality of having an underlying conception of Nature. Explicit in indigenous cosmology, however, is

knowledge and understanding of the unified laws of Nature as they express themselves in the identified symmetries in diverse IK systems. What indigenous perspectives communicate is that conceptions of IK must be derived from a framework grounded in the deepest level of natural law in order to understand what it is that IK is giving expression to. Otherwise, understanding of IK becomes eclectic and relativistic. The perspective that sees IK as local versus external or international is an humanitarian view, containing a human rights element that declares that other cultures and knowledge systems are "entitled" to expression, and, moreover, that their wisdom may be superior to the external. But the perspective of indigenous cosmology grounded in experience of natural law appears to offer a conception of IK that is more profound.

It is perhaps for this reason that the indigenous perspective emphasizes cultural continuity rather than culture change, implying again that IK definition needs to focus on cosmology and traditional qualities of indigenous awareness, rather than on knowledge of cultures per se, which may be undergoing change. In light of this indigenous perspective, it could be argued that IK is definable as the knowledge of indigenous people who are understood not so much politically at this point, but as cultures that maintain a live-tradition of cosmic-sacred awareness, or awareness of natural law as it is expressed in their place of habitation.

In light of this perspective, and in light especially of indigenous calls for healing and unlearning the past, versions of indigenous agricultural development such as Bebbington's (24), even if they are based on observed realities and choices of indigenous people on the ground, may be, as mentioned earlier, eclectic and relativistic. The literature surveyed here indicates the existence of a more profound level of IK. Custodians of this level of IK and cosmology are still to be found especially in societies less disrupted by modern culture. Working with these custodians would appear to offer a significant option, if, as they claim, they are able to act not only as guides to maps of the world's biodiversity, but, through their enhanced awareness of subtler levels of reality, they can provide the world with an improved mode of understanding, and moral and spiritual guidance also.

Conclusions

At the 1992 International Symposium on IK and Sustainable Development, Mathias-Mundy (161) observed six underlying views of IK reflected -- those of the Scientist, the Development Agent, the Facilitator, the Conservationist, the Political Advocate, and the Capitalist. She commented:

All of these streams of thought are reflected in the symposium papers, and the discussions were enriched by the various views expressed. However, *the development and facilitator positions tended to prevail*. The keynote speaker, the Hon. James Bourque, saw a danger that the retrieval of IK would benefit only the scientific community and the Western world, to the detriment of indigenous peoples.

Some participants raised the question whether the symposium should take a political position. A majority felt that the IK network should not become political. It would reach its goal -- *the application of IK in development* -- better if focused on retrieval, storage and application of IK rather than by becoming a political movement (p.5, emphases added).

The IK network's choice of goal, the application of IK in development, raises a number of critical issues:

Given the prevalence of developers and facilitators, is IK seen by the network as a corrective, another revision, to mainstream development approaches?

Will a focus on development applications result in insufficient attention to policy issues arising from the playing out of other interests, whether those of the "capitalists" such as the multinational pharmaceutical companies who seek to "convert IK into cash" (ibid.p5), or of indigenous interests in self-sufficiency and self-determination?

Will a development application approach tend to incorporate components of IK systems, and, if so, is this likely in any way to undermine the integrity and, paradoxically, the sustainability of IK systems whose defining nature has been shown to be holistic? If IK is qualitatively different in nature from Western knowledge, should application of IK reflect this?

It is beyond the scope of this review to search for comprehensive answers to these questions. But some tentative conclusions can be offered based on the literature surveyed.

One conclusion is that, contrary to the conclusion of the symposium (which was,

after all, just one symposium at which "the development and facilitator positions tended to prevail"), IK appears a highly **political issue**. It was noted above that the rediscovery and promotion of IK faces essentially the same set of marginalizing influences that have tended to limit all previous development revisions. Thus, many warn against the danger of "scientizing" or "extracting" IK to be used and controlled by powerful agencies, which, instead of empowering, would tend to reinforce usual patterns of marginalization (166,221,258). Such outcomes are perfectly predictable if one assumes the continuation today of "cores and peripheries of knowledge", or the unequal power of IK and modern science (52,53).

Fundamental in the indigenous perspective is struggle for self-determination (40,70,118) and to get alternative, indigenous values back into the policy arena (241). This means, naturally enough, that indigenous people demand full control over all aspects of their development (289), *including control over the recovery of their knowledge* (93,p.38). Clarkson (51,p.74) has made this point forcefully when she argues that:

There is an existing body of literature on development and Indigenous peoples but it has been written by non-Indigenous academics. Most issues are dealt with in a compartmentalized fashion rather than in a holistic way... Also, the existing literature, by and large, doesn't recognize Indigenous struggles as issues of development. Indigenous people must be in control of the documentation process from initial conceptualization through to the production of information products.

Projects to research and document traditional knowledge must be carried out under the control of Indigenous people, and control over the product must remain with the local Indigenous people. Otherwise, Indigenous people and their knowledge will simply be another resource to be exploited by Western society. These projects must be carried out in such a way that they strengthen Indigenous societies, rather than simply capturing the knowledge before it disappears.

Traditional...culture is indivisible; it is a totality reflecting the way of life given to Indigenous peoples and cannot, therefore, be simply an object of academic study. For these reasons, it is critical that traditional people be supported to undertake this documentation process, and to be seen as experts on sustainable development.

Perhaps for these kind of reasons, Pretty has warned (211) that the network of IK centers has to "tread carefully to avoid becoming "holders of the people's knowledge"". The Institute for Indigenous Thought and Practice has also stated that:

Mechanisms have to be developed for local people to keep or gain control of their own knowledge and prevent misuse of local knowledge through outsiders. The IK network should include or closely collaborate with indigenous and other local people and indigenous organizations (121,p2).

These concerns return us to O'Brien and Flora's question about control versus empowerment in IK discourse with which this chapter opened. Warren's list of critical research areas and policy issues in IK mentioned earlier spans the full breadth of concerns (286). However, some literature tends, probably unintentionally, to evoke the mainstream mode of development discourse among the usual crowd of developers. For example, von Liebenstein et al. (271) write of "facilitating the communication between *agents of change and their target groups*." They continue:

In order to effectively exploit the benefits of IK systems in the development process, and to exchange information *among researchers, development practitioners, policy-makers, and donors*, it is necessary to maintain institutional communication and organizational facilities at national, regional, and global level (emphasis added).

Thrupp admits that IK operational strategies are "weak and insufficient" and are open to cooptation (258).

Perhaps the notion that indigenous people should be controlling the rediscovery and promotion of IK represents one of the last of Chambers' dominoes which must fall. The notion implies that the IK project might be more appropriately conceptualized in terms of indigenous *movement* (70) than in mainstream terms. Bodley (40) records how historically, the idealist perspective became supplanted by realism in the arena affecting indigenous peoples as idealists focused on preservation and protection of tribal groups rather than on their political self-determination. Similar tensions persist today in biodiversity conservation. The difference, as noted in chapter 2, is that indigenous people today do not necessarily delegate the power to outsiders to lobby on their behalf (93).

Although interests in IK are multiple, it appears from the literature as though the political battle-line can be drawn up most meaningfully in terms of mainstream versus alternative paradigms, with characteristics as described in chapter 2.

A second conclusion is that a fragmented approach to IK (161) that focuses on

technical practices or other *components* of IK systems risks falling into the same mode of reductionism that has beset mainstream development with problems, and missing the essence of IK -- its holistic nature and, especially, its *cosmology*. Yet current practice indeed tends to emphasize extracting and transferring isolated bits of information (7).

As already stated, a consistent theme in the IK literature, especially in literature representing indigenous people's perspectives, is the holistic nature of IK and the firm conviction that the removal of IK from its paradigm does violence to both the knowledge itself and the communities holding it. IK has to be accepted as a whole (69). It cannot be used properly in isolation from the broader structure in which it is embedded (131). As Haverkort has stated:

IK is not something to be collected, frozen in models or expert systems, stored for future use by scientists, or easily transplanted to other regions. Such knowledge is generated in specific cultural and ecological systems and cannot be seen independently of these systems (99).

Gray states further that as the rainforest is marketed, the sacred is lost (93).

The danger in taking only parts and incorporating them into the mainstream knowledge system is that potential change will be circumscribed by the assumptions of the dominant paradigm (69). This was precisely one outcome that Bodeker (38) found in his research into the "integration" of traditional Chinese medical knowledge into a mainstream system via "barefoot doctors": much knowledge was eliminated in the process. In particular, traditional *theoretical* knowledge was lost, reducing classical Chinese medicine "from the status of science to a fragmented collection of techniques and remedies devoid of underlying unity of theory". Bodeker continues (p.173):

When modern medical science is assigned the terms of reference, the reconciliation or integration of modern and traditional medicine has tended to be at the level of technicality rather than at the level of theory. The outcome has been loss of traditional theoretical knowledge and instatement of modern medical theory as the standard.

Another danger of incorporation of IK into the mainstream is that in focusing on superficial artifacts or components of IK, we may miss the deeper levels that may in fact most enliven consciousness and Nature. This happened in China during the Cultural

Revolution when "barefoot doctors" were trained in acupuncture. Only one hundred acupuncture points relevant to certain more prevalent health problems were recognized and included in this training by the modern scientific authorities. It turned out that more than a hundred other pressure points were excluded and virtually lost to the traditional knowledge system. These tended to include those relating to a more holistic mind/body balance which enlivens health from a deeper level (39).

Many authors are convinced that coopting, incorporating, appropriating, "tapping", mining, extracting, or scientizing IK into the mainstream effectively strengthens existing monopolistic rights of scientific, capitalist, and state interests, tends to benefit the industrialized world, and perpetuates usual patterns of centralization, marginalization, displacement, and control by powerful agencies (70, 166, 221, 241, 258). As Durning states: "The White world wants to understand native cultures and extract fragments of wisdom which extend its own domination" (70,p.36).

Inherent in such processes is neglect of the knowledge base and the original culture. In this sense appropriating IK practices may be unsustainable by definition, because appropriation abstracts practices from the knowledge system and the culture that evolved them, and, at the same time, exposes that culture to further culture change.

Thus, an approach emphasizing incorporation of IK components runs two risks. One is the risk that component abstraction from an IK system may not be sustainable. The other is that a focus on components may miss the deeper level and synergy of an IK system, the level that enlivens Nature.

This deeper level of IK, its essence in indigenous cosmology, has been described under indigenous perspectives above. The significance of indigenous cosmology and its relevance to modern problems is a theme of much of the literature reviewed, the main points being:

The positive cultural ethos is more powerful than bureaucratic barriers in insulating common property/natural resources from human greed (95).

In this age of recognition of limits it is the mainstream culture which has to change (ibid).

Indigenous knowledge offers restoring an holistic understanding of ecological problems and appreciation of Nature's limits, or carrying capacity, that is now being increasingly reaffirmed by Western science (32,51,118).

Indigenous cosmology is capable of integrating multiple knowledge disciplines, including the knowledge and technologies of modern science (183).

Indigenous people offer the world's dominant culture living examples of ancient values that may be shared by everyone: devotion to future generations, ethical regard for Nature, and commitment to community among people (70,p.48).

Indigenous cosmology offers intuitive wisdom and moral-spiritual insight for guiding development. Indigenous people claim that they are the proprietors of spiritual consciousness which alone can save Western society from self-destruction (51).

Significantly, what IK offers appears to correspond to the three most difficult outstanding problems of the mainstream found in chapter 2, i.e., problems of holistic understanding, the admittance of alternative cultural values, and moral-spiritual consciousness.

Closely related to the political and cosmological findings above, a **third and final conclusion** is that the literature reviewed in this study points to the importance of an *indigenous, emic perspective* on IK. This is based on several principles.

If development is normative, there are moral/ethical and political/human rights imperatives to admit other cultures' norms into policy and political processes. Instead of seeing development always from a Western viewpoint, an endogenous perspective utilizes both Western and indigenous norms in setting up rational goals that other societies establish as appropriate (182). Further, pedagogical reasons dictate the active "agency" of practitioners and custodians of IK in defining development policy as opposed to the central role of state bureaucrats and professionals who attribute knowledge, ignorance, and agency for the purpose of policy-making. IK should not be re-worked and decontextualized by higher authority (111).

Conversely, as both Freire and indigenous people have advocated, while dominant elites think "about" the people in order to know them better and thus dominate them more efficiently, only the oppressed have the capacity to liberate not only themselves but their oppressors as well from the de-humanizing conditions of oppression (82).

Indigenous people hold firm convictions about moral, spiritual, socio-cultural, political-economic, and cognitive reasons why they should control their knowledge and uses made of it.

There are equally convincing technical, institutional, and managerial reasons for ensuring indigenous control of uses of IK in development, for example, uses of TEK for biodiversity conservation (32,118). As many authors have noted, biodiversity conservation is inextricably linked with cultural diversity which is in turn linked to political self-determination for indigenous people.

If indigenous culture is very strong and coherently reflects natural law, IK will incorporate only life-supporting things from outside (273). IK can integrate what is appropriate from external tools, technologies, practices, and ideas, including those of modern science. However, it has been proven by experience that the modern knowledge system and world view both consciously and unconsciously marginalizes other knowledge systems. Holistic, emic perspectives on natural phenomena and resource management are complex for outside teams to achieve.

Finally, it appears that there *is* such a thing as "pure" IK -- knowledge of natural law by a culture maintaining a live-tradition of awareness of local laws of nature especially through spiritual consciousness (51). Mazur thought that if there were such a thing as "pure" IK, that would be the key to operationalizing it (165). Incorporation of any other level of IK risks missing this deeper level. This review has found that knowledge of this deeper level of IK is obtainable only through custodians who maintain those live traditions.

In summary, indigenous control is more even than a human rights imperative. It is both rationalized and justified on anti-paternalistic, political, cognitive, cultural, and moral-spiritual grounds. Indigenous control ensures not only distributing benefits of IK equitably (69) and therefore avoiding revisionist outcomes characteristic of mainstream development. More than even that, it offers holistic understanding, spiritual consciousness, and moral-ethical principles that are apparently vital for resolving modern environmental and social problems.

CHAPTER 4. METHODS AND PROCEDURES

Objectives

The issue of interest in this study of IK was: From whose point of view is IK being defined and worked with? Who defines what IK is, and who controls its exploitation? Inherent in these questions lies a further question: What difference does "Who does the defining and controlling" make to the meaning and role of IK in the context of modern development? This question is especially relevant in light of past experience of other "revisions" (discussed in chapter 2) that have been attempted on the margins of the mainstream development model. Given this context for IK, of particular interest are indigenous, or emic, perspectives on IK as distinct from etic perspectives of Western-trained outsiders who, as professional developers, facilitators, and other players, have dominated the development scene up to the present time.

Therefore, the broad purpose of this study was to explore the ethnoepistemology of IK, investigating especially the role of indigenous cosmologies and sacred beliefs in upholding indigenous knowledge systems. The particular purpose was to see to what extent Nepali agricultural practice is influenced by the Vedic tradition which is a main source of Indigenous Knowledge in Nepal. The specific objectives of the study were:

To analyze mainstream and alternative development thought and experience establishing the context for IK discourse.

To analyze trends in indigenous knowledge discourse, and to find out the meaning and relevance of IK as articulated by advocates and custodians of these knowledge systems.

To discover how the cosmology and sacred beliefs of the Vedic tradition are interpreted and applied in the context of modern development, particularly in agriculture, in Nepal.

To determine the implications of these Vedic traditions and knowledge for agricultural education in Nepal.

This chapter is divided into ten sections as follows: research questions,

background, methods, population and sample, instruments, procedures followed, protection of rights of human subjects, data analysis, and trustworthiness and limitations of the study.

Research question

Following from the objectives, there were four research questions investigated:

1. Focusing on the agricultural, natural resources, and rural sectors, what have been the essential characteristics of a) mainstream approaches to development, including revisions in the mainstream model, and b) alternative thought and approaches?
2. In light of mainstream and alternative thought and experience, how is the meaning and role of IK defined or characterized by its advocates and by indigenous people?
3. How is Vedic knowledge interpreted and applied in the context of modern development, especially in agriculture, in Nepal?
4. What are the implications of Vedic knowledge for agricultural education in Nepal?

Background

Being a qualitative research study, at the outset it is appropriate to state the investigator's own values, background, and interest in this subject.

Prior to undertaking this study, the researcher had practiced in agriculture and rural development across many field settings and cultures for a period of fifteen years in Africa and South Asia, serving mainly as a long-term adviser, project or program manager, but also as a short-term consultant, and spanning work for governments, foreign aid agencies, and private voluntary/ nongovernment organizations. Recently, during a four-year, mid-career break to pursue MPA and doctoral programs, he studied international development from a range of disciplinary perspectives.

Throughout his experiences as a practitioner, he retained a degree of skepticism about development, particularly as he observed the impact on local cultures of missionary

activities, foreign aid, tourism, and international business, and the odds against moderating the political-economic and other forces propelling culture change. This skepticism was not dispelled by academic experience, as most intellectual efforts to explain what is happening are constrained by very partial views of phenomena. Chapter 2, which is this study's investigation of research question #1, also represents this researcher's own attempt at explanation.

While studying for the MPA degree at Harvard University, the researcher married an exiled Nepali political dissident, Durga Pokhrel, who had fled Nepal after a substantial period of political imprisonment under the Kingdom's authoritarian *Panchayat* regime which ruled the country during the period of absolute monarchy, 1960-1990. The Pokhrel family is an extensive family which includes Sanskrit scholars and Vedic pandits. Durga's grandfather was a renowned *rishi*, or seer, and her father one of Nepal's first Ayurvedic physicians educated to doctoral level at Banares Hindu University.

Married later in Kathmandu according to Vedic tradition, the researcher underwent a prolonged ritual prior to the marriage ceremonies which conferred upon him membership of a Brahmin clan - a conversion which is extremely rare even within the Hindu caste system, and which is without precedent for foreigners at least in recent Nepali history.

The final impetus that led the researcher to the field of indigenous knowledge was two years of working with his wife on a series of books based on her participation in the opposition struggle for human rights and democracy in Nepal. Much of the material for the books involved the stories of other women in prison who were non-political, but had been incarcerated as a result of local and higher level conspiracies mostly by men involved in the *Panchayat* system. The literary theme of one book became dereliction of *dharma*, or right societal and religious duty, and neglect of traditional culture, specifically the Vedic tradition, in Nepal's development process.

After co-authoring these books, this investigator now recognizes that, despite making great efforts to identify and be identified with disadvantaged client groups, for most of his years in international development he was "part of the problem" --

unconscious of the cultures and cosmologies that surrounded him. In his case, the opportunity to make an etic-emic journey of acculturation inside an "other" world view came through marriage. Having embarked upon this journey, he has begun trying to unravel the meaning of development in the context especially of Vedic tradition.

Thus, a combination of life experiences -- personal, professional, and academic -- formed the fuel for this research. In particular, the investigator became convinced that the dominant paradigm of development lacked some dimension at a fundamental level, and that, while by no means disregarding the achievements in diverse fields of modern science and technology, perspectives on development and ways of understanding of other cultures were important on moral, political, cognitive, and philosophical/epistemological grounds.

For the above reasons, the investigator's skepticism about development carried through even into the rediscovery and promotion of indigenous knowledge. In an essentially unchanged, modern global society, his hunch was that if IK were to be defined from etic perspectives, it might become operationalized as another revision in mainstream development. But, if articulated from an indigenous perspective, IK might be potentially transformational. It was this suspicion that led to choice of objectives, questions, and methods pursued in this study.

Methods

Answers to the first two research questions (relating to the first two objectives) were sought primarily through an extensive literature review and a call for papers/ assistance placed through the CIKARD network. These aspects of this research are explained more fully under "procedures" below.

The methodology for answering the third research question, relating to objective #3 -- the Nepal field study -- was guided primarily by qualitative research methods. The fourth research question was answered through a process of deductive reasoning.

Qualitative inquirers argue that human behavior is always bound to the context in which it occurs, that social reality (for example, cultures, cultural objectives, and

institutions) cannot be reduced to variables in the same manner as physical reality, and that what is most important in the social disciplines is understanding and portraying the meaning that is constructed by the participants involved in particular social settings or events. Qualitative inquiry seeks to understand human and social behavior from the "insider's" perspective, that is, as it is lived by participants in a particular social setting (15). They further state that it is an intensely personal kind of research, one that freely acknowledges and admits the subjective perception and biases of both participants and researchers into the research frame. Also, Ary et al write "qualitative researchers believe that it is impossible to develop a meaningful understanding of human experience without taking into account the interplay of both the inquirers' and participants' values and beliefs" (15,p.440). Therefore, qualitative research can produce vivid and richly detailed accounts of human experience. That is what has been attempted in this piece of research.

This study was not concerned to find out in quantitative terms answers to "how much" or "to what extent"-type questions. Rather, the emphasis was to seek in-depth understanding about peoples' beliefs, values, perceptions, attitudes, knowledge, and practices. Dabbs (63) explains the distinction between qualitative and quantitative research:

"Quality is the essential character or nature of something; quantity is the amount. Quality is the what; quantity is the how much; Qualitative refers to the meaning, the definition or analogy or model or metaphor characterizing something, while quantitative assumes the meaning and refers to the measure of it" (p.32).

Specifically in Nepal, and with regard to the Vedic tradition, how do Nepali people interpret and apply Vedic knowledge, especially in agriculture? What do they do? What practices and rituals do they perform that exemplify its meaning, utility, or power? What do they believe, feel, think, and understand about their traditional knowledge? What do they know about it? What are their views on the causes of its decline, or on the need for its revival? These kinds of questions naturally indicate a qualitative approach.

This study did depart, however, from a classic naturalistic methodology to the extent that, for various reasons explained under "instruments" below, the investigator was unable to travel to Nepal in order to collect the qualitative data. Instead, the researcher

designed sets of interview questions for different categories of respondents in Nepal, and obtained the help of three Nepali research assistants to undertake the interviewing. Therefore, the research could be described as a "survey" to the extent that the data gathered were responses to predetermined questions that were asked of a sample of respondents (15).

Trustworthiness and limitations of the research approach are discussed at the end of the chapter. Overall, the researcher is confident that by means of this "qualitative survey", he was able to gain an adequate understanding of the social, cultural, religious, and spiritual reality of a predominantly agricultural nation.

An important reason for this confidence was the investigator's access to communities in Nepal through his Nepalese in-laws, as well as himself having lived in Nepal for a period of four and a half years, working as agricultural adviser to a government integrated rural development program and living in traditional Nepali communities. The researcher's wife, closely associated with the presently ruling Nepali Congress party, provided access to a variety of national custodians of Vedic culture, as well as political leaders, and policy makers, who were expected to co-operate in this research even when it was conducted from a distance. As a result of these connections, the investigator was not only familiar and experienced with, but, to an unusual degree, an "insider" to the culture being studied.

The role of the researcher's wife in this study was critical in helping accomplish an emic, insider's perspective on the subject. Essentially her direct assistance covered: i) confirming the meaning and relevance of interview questions the investigator designed; ii) translating interview questions into colloquial Nepali in such a way that they conveyed appropriate concepts in Nepali terms, or emic categories; iii) translating responses back into English, with continued attention to emic meanings. Her reputation and direct support (for example, in writing and making telephone calls to Nepal) was also important in encouraging the conscientious participation of some respondents. As a result of all these factors, this research was indeed the result of "an interplay of both the inquirer's and participants' values and beliefs."

Population and sample

The Nepal study (relating to objective #3) was national in scope. The targeted population included politicians/policy-makers, Vedic pandits, priests, Ayurvedic physicians, astrologers, agricultural professionals, and farmers from various parts of the country and by agro-ecological zone. The number of respondents who actually participated in the survey was:

Vedic pandits:	6
Priests:	5
Ayurvedic physicians:	3
Astrologers:	2
Ag. professionals:	3
Farmers:	57

Respondents were selected from both national and local levels. National level respondents included the Vedic pandits, including two of the most renowned pandits in Nepal, as well as the royal priest and astrologer; the agricultural professionals; and ayurvedic physicians. At the local level, respondents included the priests and farmers.

Instruments

The primary instruments employed in this research were literature search, correspondence, and interviews with respondents by research assistants. All questions asked of respondents were in the Nepali language, with the exception of questions for agricultural professionals, which were in English.

The researcher decided against travelling to Nepal in order to act as the primary "instrument" in collecting the qualitative data for two reasons. First, the expense and logistics involved in a family of four travelling to Nepal were beyond the means available for this project. The second reason had to do with available time for "field work". The researcher designed the interview questions in December 1992, but would have been unable to travel to Nepal until a brief two-and-a-half month period during the summer of 1993. The researcher judged that the quality of data that could be collected earlier over a

six-month period (January to June 1993) by well-qualified research assistants who were already established in Nepal, and who were Nepalis, might equal if not exceed the quality of data that the researcher could collect himself during a more rushed two-and-a-half month period in the summer. From many years experience of managing field work and consulting in third world conditions, and specifically in Nepal, the researcher knew how time-consuming and unpredictable it can be to reach and schedule interviews with especially rural people in traditional societies.

In the event, this judgement proved correct as, during the 1993 summer period, Nepal suffered devastating monsoon flood damage and loss of life, as well as serious political disturbance requiring the imposition of a curfew for an extended period of time. These conditions would have made data collection extremely difficult.

Research assistants were used as the instruments for carrying out interviews at all levels, and they completed their work by June 1993, before the onset of the monsoon. Seven interview schedules were designed as appropriate for: farmers, village priests, pandits, astrologers, ayurvedic physicians, agricultural professionals, scholars/historians, and policy makers. Each interview schedule covered questions relevant to the type of respondent. For example, questions posed to pandits concerned their knowledge and interpretation of Vedic texts, their views of development and agricultural science, their knowledge of specific principles and technologies that applied to agriculture, their characterization of the structure and functioning of the indigenous knowledge system in the past and the present, and their role as Vedic specialists. The interview schedules corresponding to responses actually received from Nepal (see limitations below) are attached in Appendix III.

The selection of research assistants (R.A.s) was crucial in obtaining trustworthy data. Three assistants were selected. One was the Personal Assistant to the President of the Nepali Congress Party, K.P. Bhattarai -- a Gandhian and a father-figure in Nepal's half century of struggle for democracy who served as Interim Prime Minister during the 1990/91 transition to democracy. His P.A., a woman, Kabita Bhattarai (no relation), holds Master's Degrees in Zoology and Ecology and is currently active in sustainable

agriculture and social/women's organizations. The second assistant was a nephew of the researcher's, Sanjaya Dhakal. He pursued a Sanskrit education up to secondary level, and holds a Master's degree in Statistics. In 1992, he worked as a group leader in a government demographic survey in eastern Nepal. The third Nepali R.A., Dr. Ramesh Khadka, was a colleague and personal friend of the investigator's from the time when they had worked together for several years on an agricultural program in eastern Nepal. He had recently completed his PhD in agronomy from the United Kingdom. From personal, professional, and political commitment, all three R.A.s were devoted to assisting the principal investigator in the research in a sincere, reliable manner.

Ms Bhattarai's methodological briefing and orientation towards the study objectives was undertaken by telephone while she was in the USA as Nepal's official observer of the 1992 U.S. elections, and by follow-up correspondence and telephone conversations with her after her return to Nepal. Others were briefed by correspondence and by Ms Bhattarai in Nepal.

Procedures followed

An iterative research procedure was followed involving an interplay between two types of research activity: i) literature review and case studies from secondary sources to develop a conceptual framework for indigenous knowledge discourse generally, and for understanding the kind of phenomena being investigated in this research; ii) procedures designed to elicit more in-depth information about the Vedic knowledge system in Nepal.

1. Literature review:

- a) International, inter-disciplinary literature on development was studied at ISU in order to establish an ideological, experiential, and paradigmatic context for IK.
- b) International literature on indigenous knowledge was studied through CIKARD in order to (i) trace the history of current interest in IK, (ii) identify the ideological and disciplinary origins of different lines of thinking about IK, (iii)

investigate different epistemologies, characterizations, and definitions of IK.

c) Vedic texts and literature, both general, and specific to agriculture and natural resources, were studied in order to develop an understanding of Vedic cosmology and specific references to agriculture in the Vedic tradition.

d) Literature on Nepal provided contextual material, i.e. to place the knowledge system being studied in time, place, and cultural context. These included: (i) government policy and planning documents relating to rural and agricultural development; (ii) research literature on social change and rural and agricultural development; (iii) general literature covering history, culture, religion.

e) Literature of the Vedic revival movement founded by Maharishi Mahesh Yogi was studied to provide a present-day seer's interpretation of original Vedic texts and their application to modern problems.

2. Call for papers and case studies

The purpose of seeking these documents was to gather case studies from which to develop an epistemological typology of IK systems to be incorporated in the literature review. A call was put out through the CIKARD network -- a global network of some 4,000 development scholars and practitioners -- for papers, textual references, or cases which explored or illustrated the role of cosmology as the underlying foundation for an indigenous knowledge system.

3. Data collection from Nepal

There were five types and levels of data collected: i) textual material on Vedic science and philosophy; ii) current interpretations of the texts by pandits; iii) implementation of knowledge by astrologers, priests, and Ayurvedic physicians serving a community; iv) knowledge of, attitudes towards, and practice of indigenous knowledge by

rural farmers; v) National policy documents published by His Majesty's Government of Nepal.

The procedure for collecting these data involved correspondence, and interviewing of respondents by the Nepali research assistants.

4. Visit to Fairfield, Iowa

A visit was made to Fairfield, Iowa to meet faculty of Maharishi International University and professional staff of MIU's Institute for Science, Technology, and Public Policy who are involved in the fields of management, development, and agriculture. Their interpretations, perspectives, and local application of Vedic knowledge enriched the understanding of the Nepal data and assisted in formulating the consciousness framework of analysis developed in chapters 2 and 3.

Protection of rights of human subjects

The research was completely harmless to all who participated, including respondents and research assistants in the study of Vedic tradition in Nepal. Before asking respondents to participate, the research assistants explained the purpose and scope of the investigation in Nepali drawing on a cover letter (Appendix IV). This message, together with samples of interview schedules, was provided to and approved by ISU's human subjects committee. Confidentiality of responses was maintained with the exception of certain custodians of Vedic tradition who indicated that it was appropriate that their views and interpretations be public.

Data analysis

This involved:

1. Study and interpretation of original Vedic texts in consultation with Vedic scholars in Nepal and at MIU.
2. Translating and transcribing of pandit interpretations of Vedic cosmology from Nepal.

3. Translating and transcribing professional, policy, and field data on indigenous knowledge practices from Nepal.

4. Breaking down these transcribed data into small units, and then sorting them and building up a story of Vedic cosmology and indigenous knowledge practice in Nepal within a Vedic theoretical framework.

5. Drawing conclusions on the role of cosmology and traditional practices in sustaining IK systems, and the relevance of principles and practices of Vedic science to other indigenous knowledge systems.

Trustworthiness and limitations of this study

There are various ways in which qualitative researchers strive to obtain "quality" data and develop insights which others may regard as credible and trustworthy. These involve such procedures as careful negotiation of access, prolonged engagement, persistent observation, triangulation, and debriefing with respondents and peers. The extent to which the field component of this study approximated to these requirements can be summarized as follows:

i) Access of the researcher to the "research site" and to respondents in Nepal was "pre-negotiated" to a large extent through his marital connections, previous long-term residence in Nepal, and continuing contact with the society. In 1991, after the revolution which overthrew the Panchayat regime, he visited Nepal for the purposes of a consultancy and met Nepal's interim political leaders as well as family and professional colleagues.

ii) The conditions of prolonged engagement and persistent observation were also satisfied to quite an extent by the same circumstances, and especially through the assistance of the researcher's wife in this study.

iii) As described above, the three Nepali research assistants are personal friends, professional colleagues, and, in one case, a relative. They were selected deliberately as a complementary team, both professionally, and in terms of differing bases of loyalty and interest in the research subject.

iv) Triangulation was achieved to the extent that diverse categories of respondents participated in the study, providing multiple sources of data and perspectives on the research questions. In some cases, the research assistants provided copies of one respondent's responses to other people of the same category (e.g. pandits), who attested that the answers given were representative of their views also.

v) Debriefing was planned. However, as discussed below, data arrived from Nepal only in June/July 1993, which was too late to allow debriefing following analysis.

vi) A detailed journal was maintained during the early stages of research design and data collection, and questions and progress were discussed with the investigator's major professor, other faculty advisers, and with some scholars in the field of international development. In some instances, methods were adjusted as the study progressed following the qualitative research principle of emergent design. In particular, the approach taken in the search and analysis of literature evolved in response to such consultations. Also, the disappointing result of the CIKARD network call prompted greater emphasis on search of existing literature at CIKARD, and raised the relative importance of the Nepal study in the balance of the research project.

Overall, the researcher believes that the procedures adopted succeeded to a significant extent in accomplishing the research objectives and, specifically, in producing a meaningful account of the cosmology and sacred beliefs of the Vedic tradition as interpreted and applied, especially in agriculture, in Nepal today.

Limitations were both inherent in the study's choice of methodology, and unintended.

By "unintended limitations" are meant aspects of the research which fell short of what was planned. The disappointing response to the CIKARD call for papers was one such shortcoming. There was only one response, from a scholar in India. In a way, this poor response rate is significant as it appears to demonstrate that those involved in the IK network are not highly conscious about the cosmological and sacred dimensions of IK.

There were other unintended shortcomings in the Nepal field work. One has

already been mentioned: responses from the research assistants' field work were delayed, preventing planned debriefing of respondents following data analysis. Worse still, one packet of data, which included the responses of historians, politicians, and policy-makers were lost by an international courier company. Unfortunately, copies of the material had not been kept in Kathmandu.

Another unintended limitation was that the pressures of political strife in Nepal prevented political leaders from giving interviews, even with Ms Bhattarai's daily access. As a result, it was not possible to collect the full scope of responses that had been planned, i.e. spanning interpretation, practice, and reflection of Vedic tradition in policy.

There were two limitations inherent in the research design and methodology. One related to the use of research assistants for interviewing. Clearly, this procedure may have introduced communication "noise" and "losses" of meaning, as well as precluding the possibility of non-structured observation by the principal investigator, and observer-subject interaction. However, as noted above, the researcher strongly believes that his wife's intimate knowledge of respondents and ability to translate intelligently helps to correct for this shortcoming and to produce a product (i.e. chapter 5) that *does* tell a story in the way that the respondents intended.

The second limitation was one of scope and generalizability. The study of Vedic tradition in Nepal does not represent the totality of indigenous knowledge and cosmology in Nepal. The Vedic tradition is the root of the cosmology and knowledge system of the vast majority of the Nepali population who are Hindu or Buddhist. But there are other ethnic groups and religious minorities in Nepal, some of whom pre-date as inhabitants the Aryan populations that introduced Vedic culture, who, while to a large extent acculturated into Hindu-Buddhist culture, must maintain other indigenous knowledge systems. Their knowledge did not fall within this study's scope.

This study was also limited in that neither could it attempt more than a "scraping of the surface" of a knowledge system as vast as the Vedic tradition, nor did it undertake a systematic ethnoscientific study of any particular aspect of indigenous knowledge in Nepali agriculture. Rather, the intention was exploratory, and to point instead toward

more specific areas for future research.

External validity of the Nepal findings was not an objective. The primary purpose of the study was to understand one indigenous knowledge system, not to generalize from this group to any other group. In terms more of significance, an effort was made in the literature review to set this study in the context of other cosmological studies and to explore the relevance of the Vedic knowledge system as a framework for better understanding the basis of other knowledge systems.

CHAPTER 5.

VEDIC KNOWLEDGE AND AGRICULTURE IN NEPAL

Vedic traditions provide the foundation for developing consciousness and mind/body integration first, and then a right relationship between the person and the surrounding environment and its development for use by all life. For this reason, one cannot study and understand Vedic agriculture in isolation. Any aspect of Vedic tradition has to be understood in its totality. Similarly, Nepal's rather stagnant agriculture is not simply an agronomical problem but needs to be understood in Nepal's total context.

To understand this total context, this chapter begins with a brief presentation of Nepali demographic characteristics and her effort at planned development. Similarly, in order to gain a basic understanding of the entirety of the Vedic tradition encompassing agricultural knowledge, an effort is made to analyze the Vedic texts, and then only the responses of the interviewed respondents. By way of introduction, Vedic traditions are first explained briefly as interpreted by Eastern and Western scholars in the field and as they appear in the texts.

The study region

Nepal is a Hindu Kingdom (103), landlocked in the Himalayas between the Tibetan region of China to the north, and India to the south, east, and west. Almost rectangular in shape, the country is divided along its length into three ecological zones: in the north, the thinly populated high mountain zone between 4,000 and 8,000 meters; the central or mid-hills between 600 and 4,000 meters, consisting of hills, valleys, and basins; and the southern plains, or *tarai*, bordering the vast Ganges basin of India.

Two-thirds of Nepal's 147,181 sq. km. total land surface is hills and mountains, and only 0.7% is occupied by settlements and roads (107). In a country measuring 885km. from east to west, and with a mean north-south width of 193km., the total construction of roads and bridges is only 7,007km. of which only 41% is hard-surfaced. The population influenced per km. of road is only 2,632 and land area influenced per

km. of road is only 21 sq.km (ibid). It has been estimated that one third of Nepal's people require three days' walk to reach a motorable road (266).

Kathmandu, Nepal's capital, is situated in the largest valley in the mid-hills at about 1,300 meters altitude. The valley stretches about 25km. from east to west, and about 19km. from north to south, totalling about 764 sq.km in area. The valley is surrounded on all sides by high hills averaging over 2,000 meters in altitude.

Administratively, Nepal is divided into five development regions, fourteen zones, and seventy-five districts.

The total population of 18,491,097 (108) is distributed across the ecological zones with 7.3% in the mountains, 46% in the hills, and 46.7% in the tarai. Regionally, i.e., by development region, the population is distributed as follows:

Eastern:	24%
Central:	33.5%
Western:	20.4%
Midwestern:	13%
FarWestern:	9.1%

Across its rugged topography, there are thirty-three administratively recognized urban areas in the Kingdom, but they contain only 9.2% of the country's total population.

Although the dominant religion is Hindu, other religions are also represented according to the following breakdown: Hindu, 86.5%; Buddhist, 7.8%; Islam, 3.5%; Others, 2.1%; Not stated, 0.1% (108). Compared to the 1981 Census, the Hindu population has decreased by 3%, Buddhist increased by 2.5%, and Islamic increased by 0.8%. The "others" follow primarily Hindu traditions and comprise chiefly certain low-income artisinal groups. Social and cultural norms of Hindus and Buddhists are virtually the same, and inter-marriage and socialization are common. Muslims practice their own religion but are regulated by national law whose source is Hindu law (202). There are a few thousand Christians also, but prosletysing and religious conversion are prohibited by the law of the land (104,19(1)).

The Nepali population is a complex multi-racial and multi-ethnic mixture.

Unfortunately, statistics on ethnicity are not available (2). However, there are linguistic data that show the distribution of different language groups (107). These rank the total population as follows: Nepali-speaking, 58.4%; Maithili, 11.1%; Bhojpuri, 7.6%; Tharu, 3.6%; Tamang, 3.5%; Newari, 3%; Apadhi, 1.5%; Rai/Kirat, 1.5%; Magar, 1.4%; Gurung, 1.2%; Limbu, 0.9%, Bhote/Sherpa 0.5%; Rajbarushi, 0.4%; Satar, Sunwar, and Danwar, 0.1%; and others totalling a little more than 5%.

As Westerners are aware, Nepal, being a Hindu society, is structured according to caste divisions, the Vedic term for which is *Varnaashram dharma*, or righteous duty according to social class (*varna*) and stage of life (*ashrama*). Accordingly, a Shah King, a *Kshatriya* (warrior) caste, has ruled unified Nepal since 1779. The other *varnas* are *Brahmin*, *Vaishya*, and *Shudra*.

Nepal is predominantly an agricultural country, with more than 90% of the economically active population involved in agriculture. Table 5.1 shows the breakdown of occupation.

Table 5.1 **Agricultural/non-agricultural occupation by sex**

	Total	Male	Female
Agriculture	91.4%	88.9%	96.1%
Non-agricultural	6.3%	8.1%	2.9%
Unidentified	2.3%	3.0%	9.0%

Source: National Population Census 1991 [108]

The agricultural sector contributes about 53% of gross domestic product. Agriculture also accounts for 75% of exports (105). However, land used for agriculture comprises only about 18% of total land surface. Table 5.2 shows the land use pattern.

The land tenure system in Nepal is very complex. Directly or indirectly all land belongs to the government. However, its usufruct is organized mainly either on a *guthi* or a *raiker* basis. *Raiker* land is essentially individually held. *Guthi* (trust) land is subdivided into *Devaguthi*, divine trust, *Rajguthi*, royal trust, and *Janaguthi*, people's trust. In each

Table 5.2 Nepal land use

Type of land use	Area(sq.km.)	%
Agriculture	26533	18.0
Forest	55334	37.6
Snow	22463	15.3
Pasture	19785	13.4
Water	4000	2.7
Settlements & roads	1033	0.7
Waste/barren land, slopes, landslides etc.	18033	12.3
Total	147181	100.0

Source: National Planning Commission, 1990 [107]

case trustees manage the use of the land. *Devaguthi* lands, formerly the predominant category, were granted in honor of the deity most worshipped in a locality. Trustees follow the *Dharma* of nurturing this land and donating produce to the *Devaguthi* fund. The *guthi* land of the Kirati and Rai ethnic groups is called *Kippat*.

To regulate all *guthi* land there is a central-level government *Guthi Sansthan*, trust corporation. Until the mid 1960s, it was impossible to buy or sell this land. Now the government has introduced regulations allowing such transactions, but the procedures for their conversion into *raiker* are very cumbersome, involving consultation of all *guthi* membership in every case.

Because of the status of land in Nepal, people husband their land with great care. The use of *guthi* land, most especially *devaguthi*, is by definition based on spirituality. *Raiker* land is precious due to its scarcity. Also, as Sita, the main female character in the epic, the *Ramayana*, was said to have been found as a baby on *guthi* land in the *tarai*, all Nepalis worship their land as the Mother Goddess. A similar belief underlies the ban on plowing in the Kathmandu valley where blood, believed to belong to an image of Lord Vishnu discovered in one of Kathmandu's *guthi* lands, was once found on a plowshare. That ancient statue of Vishnu still lies in a shrine on a hillside just north of Kathmandu, and remains a great holy place for Hindus and an attraction for tourists.

In ancient times, Nepal enjoyed a "golden age" when the kingdom followed her

Vedic traditions in all respects. The Licchavi period, between 300 and 200 B.C., was the most famous "golden age" in Nepali history. During that time, agriculture was the chief occupation of the people, and the government paid great attention to protecting cultivated land, ensuring that farmers fenced their fields in accordance with *Manusmriti* (VIII.238-240). If any damage was caused by cows and other animals, the herder was punished. Fines could also be levied for destroying grain. There was no system of landlordism (*Manu* IX.44). In order to meet emergencies like famine caused by drought or floods, the government built granaries where foodgrains and seeds were kept in reserve. During the period of trouble the poor and the needy were fed and helped to re-start their farms.

Many varieties of rice were grown, the staple food of the people. The ordinary variety was called *vrihi*, the fine variety was *sali*. Both had different sub-strains. Pea and many other pulses were grown. Cultivation of vegetables, fruit trees, and sugar cane was done with great interest and delight (130). Vegetables included brinjal, radish, bottlegourd, cucumber, and catmint, and the stalks and roots of lotus, and mustard stalks were consumed also as vegetables. Fruits included mangoes and bananas in abundance, and many other species. Oil came from sesamum, mustard, castor, linseed, and safflower. Aromatic plants, spices, indigo, and fibrous plants.

Although there were political "ups and downs" within Nepal, foreign influence was kept away almost entirely until 1950. Even during the Muslim and British invasions of the Indian subcontinent, Nepal managed to remain free from direct foreign rule. Thus, any "development" that occurred before 1950 was essentially indigenous. Specifically in agriculture, there was no external intervention until 1956.

After overthrowing autocratic Rana rule in 1950, Nepal enjoyed a decade of democracy during which time a little Western "development" started in the Kingdom. But in 1960, the King carried out a coup in which he imprisoned all the elected cabinet members and had many democrats killed. After the coup, development became modeled with Western money in their style and terms to such an extent that one prominent Nepali scholar called for a moratorium on foreign aid (122). Within thirty years of the King's *Panchayat* system, social and political opposition had grown strong enough to force the

present King in 1990 to abolish the Panchayat system and re-introduce democracy.

Under authoritarian rule, any Nepalis attempting to voice their opposition to any aspect of development were expelled from their jobs if they were government officials, or thrown in jail and tortured ¹. Therefore, Nepalis maintained silence until the Panchayat regime started disintegrating. Nepalese experience seems to indicate how closely political freedom and mode of development are related. In particular, freedom of expression appears to be the main precondition of participatory development. After the 1990 return of democracy, Nepalis again became able to express the kind of development they prefer for their motherland. Authoritarian rule supported by Western foreign aid had been particularly hostile in suppressing expression by custodians of Nepal's Vedic tradition.

Over most of the country there are two agricultural seasons: winter and monsoon. But in the Kathmandu valley, as many as four crops are grown per year. The principal food grains in order of importance are paddy, maize, wheat, barley, and millet. Among cash crops, sugar cane is most important, then oilseeds, tobacco, jute, and potato. Data for the 1980s show that overall national production of food was just in excess of requirements except for 1982/83 and 1986/87.

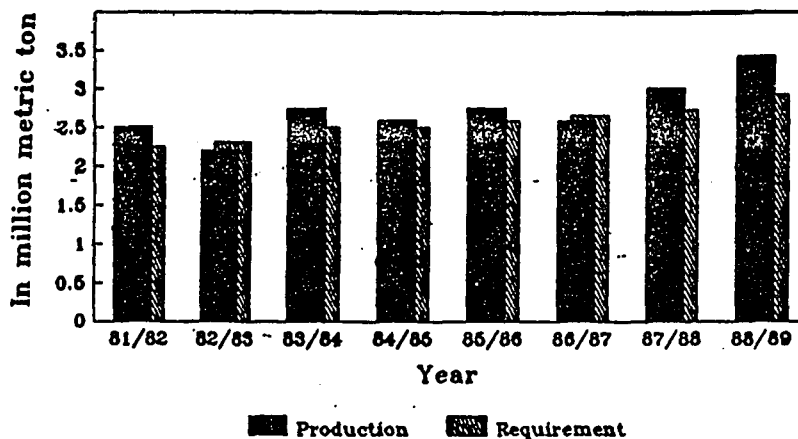


Figure 5.1 Food Balance Sheet (1981 - 1989) (Source:107)

¹ The researcher's wife spent altogether two years in jail for being critical of the government.

However, both mountain and hill districts frequently experience food deficits. Although on a national level the balance required in the hills is theoretically made up by *tarai* production, problems remain in transporting food to deficit areas especially considering transport costs from the *tarai* to neighboring India are much less. Moreover, gross statistics disguise issues of entitlement and purchasing power. Such issues manifest in Nepali social indicators remaining well below South Asian averages.

Nepal's population is growing at 2.6% a year. Life expectancy is only 52 years. Infant mortality is 113 per 1000, and the under-fives mortality rate averages 165 per 1000, climbing to 300 in some areas. Adult literacy is only 39%. Although 49% of the population spend 70-80% of their income on food, they fail to meet their daily calorie needs. There are an estimated 2.7 million ultra-poor who spend more than 80% of income to satisfy less than 80% of calorie requirements. 95% of the poor are concentrated in rural areas, and more are in the hills, where food is more expensive, than in the *tarai*. Most of the poor cultivate their own small plots of land -- 74% in the hills and 54% in the *tarai*.

Nepal's malnutrition rate is one of the worst in the world. Recent statistics are not available, but a 1975 national survey found almost 52% of children between 6 and 72 months were chronically malnourished, while 6.6% were acutely malnourished. A recent UNICEF review of micro-level surveys indicated that the situation has worsened since the 1975 survey (5). The percentage of households consuming less than the recommended levels of food is highest in the rural hills -- 47%. Even in the rural *tarai*, the food surplus producing region, 23% of households consume less than requirements. Serious micronutrient deficiencies are also prevalent.

Systematic planned development started in Nepal only in 1956. Currently, the eighth development plan is underway. Every plan has given prominence to agricultural development, and budgetary allocations for agriculture have steadily increased, practically doubling from Rs.850,000,000 to almost Rs.1,700,000,000 from 1985/86 to 1991/92

fiscal years alone (110)². During the 1970s the use of chemical fertilizers quadrupled, the use of improved seeds increased five times, total agricultural loans disbursed through institutional sources increased more than twelve times, the number of technicians working in the Department of Agriculture increased from 1,400 to 3,200, and more than 150,000 hectares of land were brought under irrigation (122). The Seventh Five Year Development Plan (1985-90) had set a target of having 22% of total cultivable land irrigated by the end of the plan period. These trends -- of modernizing agriculture under the transfer-of-technology, Green Revolution paradigm -- were maintained through the 1980s. For example, an average of 2739 metric tons of improved seeds of paddy, wheat, and maize were purchased annually through the 1980s, and consumption of imported chemical fertilizer climbed from 145,000 Mt. in 1985/86 to over 220,000 Mt. in 1989/90 (110).

As the improved seeds data suggest, most of the technology transfer effort has been invested in major cereal crops. However, despite expansion in cropped area at the rate of 1.9% per year, production of staples has increased only 1.4% per year over the past 20 years. Some data suggest that, on a national level, yields of the three major crops have shown a slight upward trend since the mid 1980s (110). However, these data almost certainly reflect primarily the trend in the *tarai*. Yield trends for oilseeds and pulses over the same period have tended to be stationary or negative.

In 1983, a policy-maker commented about agricultural development that "the result is that production has gone down in absolute terms, and the yield per hectare has decreased"(122). Pointing out the failure of all Development Plans in Nepal, Pandey concluded that it was unlikely that Nepal's situation could be improved by "tinkering with certain elements of the system", or by seeking purely technical solutions to complex problems. First and foremost, there was a need for regenerating an atmosphere of *hope and confidence in the masses* as well as among the intelligentsia, both of whom were currently seized by growing dissatisfaction "bordering on despair". Then there was the

² The prevailing exchange rate is Nepal rupees 49 to the U.S. dollar.

issue of "political will and commitment" which should manifest itself in more concrete terms demonstrating a sense of the nation's destiny and vision for the future. This would allow, among other things, a "soul-searching" analysis of Nepal's development objectives and the relevance of the basic planning model which had been in use without effect and without any change except for cosmetic applications of whatever conceptual vocabulary and categories were in vogue at the time of a given exercise.

Knowing this policy-maker personally³, this researcher senses that what he meant by "hope and confidence" and "a sense of the nation's destiny and vision for the future" was closely similar to the theme of this research, i.e., development based as much as possible on Nepali indigenous knowledge. This vision stands in contrast to foreign perceptions of Nepali possibilities which are evidenced in USAID's (1984) Country Development Strategy Statement (266) which saw in Nepal "an array of obstacles which typify many LDCs but in the Nepal context appear particularly imposing. The major constraints includ[ing]... a rural household production system dependent on traditional technologies... and deeply ingrained cultural... factors bolstering resistance to attitudinal change."

In the present democratic political environment, political will may act more positively towards an endogenous mode of development, and Nepali people who remain attached to their cultural traditions may be freer to return to the root of their indigenous knowledge. The present Nepali Congress government is acutely conscious of the legacy of the past thirty-five years of "development". In their approach to the 1992-1997 Eighth Plan, the government concludes: "In spite of the huge investments made in the economy in the past 35 years, Nepal remains one of the poorest and least developed countries in the world."

The Eighth Plan gives top priority to agriculture, emphasizing appropriate agricultural technologies for farmers' needs in varying agro-ecological conditions, and special attention to developing technology for rainfed and hill agriculture. The new

³ He became Minister of Finance in the 1990-91 post-revolution interim government.

government also proposes to establish a separate agricultural university to meet the "need for high-level trained manpower". The framework for these priorities is a new planning philosophy which recognizes "mass awareness and consciousness for self-development... and self-reliance in conjunction with development initiatives at the community level." In describing this "bottom-up", participatory philosophy, the plan frequently mentions NGOs.

As becomes clear also from respondents' comments, given the new political climate, it seems very possible to revive the Vedic tradition as the foundation for Nepali development. Only a small, visionary group of Nepalis committed to their tradition is needed to influence government policies to ensure that the main mode of development adheres to Nepal's indigenous knowledge.

The respondents

The respondents to the interview questions for this study were chosen from among the above-mentioned castes and ethnic groups. Specifically, keeping the research question and objective in mind, respondents were selected to represent categories by area of expertise as follows:

i) Vedic pandits were Brahmin caste with one exception who belonged to the Rai ethnic group. The Rai pandit had been granted the status of Brahmin caste by liberal Vedic pandits in recognition of his in-depth study of the Vedas. Since the medieval period, study of the Vedas has been limited to Brahmins, and the caste system rigidified. Traditionally, the main *dharma* of Brahmins has been the study of the Vedas and the transmission of that knowledge to others.

ii) Priests were all Brahmin. Priests who carry out Vedic traditions are by definition Brahmins. To become such priests, Brahmins study specific branches of the Vedas called *karmakaanda*. They then help ordinary people to perform Vedic rituals all year round. Some Nepali ethnic groups have their own priests who practice a mixture of their own ethnic traditions and Vedic rituals. These are not covered by this research because its focus is on the pure Vedic tradition. Neither has this study gathered

information on the extent to which other priestly groups follow Vedic practices.

However, one certain characteristic of Nepali society is that the norms of all such groups are Hindu (202).

iii) Ayurvedic physicians interviewed were Brahmin and Newar, although other ethnic groups also practice this profession. In this study no attempt was made either to represent or to limit coverage of any particular caste or group. Ayurveda is one of the most important branches of Vedic knowledge, and remains important in Nepal's national health system.

iv) Astrologers interviewed were also Brahmin or Newar. Again, any varna could practice *jyotish*, or astrology, another prominent branch of the Vedas. Before practicing, some Nepalis systematically study *jyotish*, while to others ability appears to be gifted either genetically or by intuitive sense. The official Nepali lunar calendar is totally based on astrological and astronomical calculations, and is presently ahead of the Western calendar, having reached the year 2050.

v) Farmers were from a wide range of ethnic groups and castes.

vi) Agricultural professionals also represented several ethnic and caste groups.

What are the Vedas

Vedas are considered to be twenty-five thousand years old (Sampurnananda and Abinashchandra, 1993). However, by interpreting astronomical data some scholars have tried to show that Vedic literature dates only to 4,000 to 6,000 B.C.⁴. According to the ancient Aryans, Veda is a collection of texts which provide directions for those wishing to achieve their desires and extraordinary divine ways for avoiding unwanted phenomena (3).

Many Western, as well as Eastern, philosophical texts describe the Vedas as "the treasure of Divine knowledge" (201). Comparing the Vedic tradition with other older traditions around the world, Basham (21) writes:

⁴ H. Jacobi of Bonn, B.G. Tilak of Poona, and P.C. Sangupta of Calcutta, cited in Raghavan (212)

The ancient civilization of India differs from those of Egypt, Mesopotamia, and Greece in that its traditions have been preserved without a break down to the present day. Until the advent of the archeologist, the peasant of Egypt or Iraq had no knowledge of the culture of his forefathers, and it is doubtful whether his Greek counterpart had any but the vaguest ideas about the glory of Periclean Athens. In each case, there had been an almost complete break with the past. On the other hand, the earliest Europeans to visit India found a culture fully conscious of its own antiquity...and not fundamentally changed for many thousands of years. To this day legends known to the humblest Indian recall the names of shadowy chieftains who lived nearly a thousand years before Christ, and the orthodox Brahman, in his daily worship repeats hymns composed even earlier. India and China have, in fact, the oldest continuous cultural traditions in the world... The Vedic hymns are still recited at weddings and funerals, and in the daily devotions of the Brahman... and do not belong to her buried pre-historic past.

The Veda is said to embody the regulations, the laws of the universe, as "seen" by gifted poets, prophets, or seers -- the *rishis*. Encoded by them in a special language to be "joyfully proclaimed for future ages", the Veda has been passed down to us through an elaborate oral tradition consciously designed to prevent any distortion⁵. Even today, had we no written record available, it would still be possible to have access to the Veda as it existed when the texts were established over four thousand years ago. This supreme monument of an early religion which left no archeological remains, no church, no dogma, no founder, and virtually no history, forms the canon of the Hindu scriptures (152).

Hinduism, states LeMee, according to its own tradition and belief, is not a

⁵ Vedic Sanskrit has always been known as *Deva bhasha*, "Divine language", because the words are understood to "vibrate" with the primordial sounds of the universe. The Vedic word *mantra* in fact literally means "sound vibration to free the mind". For this reason, correct pronunciation of the words is vital in order to achieve the desired influence or effect. It is also very difficult to translate into English since the Sanskrit script, *Devanagari*, consists of 14 vowels, and 36 consonants each of which is pronounceable in 14 different ways following the pattern of the vowels. Unlike English, the script has to be pronounced as it is written.

For these reasons, the translation of Vedic hymns and *mantras* into their direct English meanings might carry their broad gist, or sense, but fails inevitably to capture the "vibration" quality of the *Deva bhasha*.

religion belonging to a particular people or country, but is what remains of an ancient system of knowledge, the *Sanaatana Dharma*⁶, which, in another age, was the inheritance of the whole of humankind (152). Hinduism therefore sees itself as the holder of a tradition common to all peoples, encompassing all that revelation and human effort have produced in terms of knowledge. Thus, the term "Veda" means, in the most general sense, *knowledge* -- that is, the sum of knowledge by which one must understand all the "arts" and "sciences" required by the religious life. It is, to be more specific, "*sacred knowledge*", or the knowledge of superhuman or godlike powers together with the methods required to influence them (230).

The Vedas' main emphasis is on *rta* -- the cosmic order.

The vision of *rta* may be called the vision of cosmic wholeness... [and] harmony in a human being is a reflection of the cosmic order... At the cosmic level, *rta* is the law of harmony; at the human level, the law of truth, righteousness, justice; at the personal level, integrity, the manifestation of the human conscience, the silent voice that guides conduct and points to the right (169).

About the Vedic-inspired cultural context of India, Basham (21) writes that in no other part of the ancient world were the relations of man and man, and of man and the state, so fair and humane. In no other early civilization were slaves so few in number, and in no other ancient lawbook are their rights so well protected as in the *Arthashastra*⁷. No other ancient lawgiver proclaimed such noble ideals of fair play in battle as did

⁶ *Sanaatan* means "indigenous", or "maintained in its original form without any break".

⁷ *Arthashastra* literally means "Economics text". Also known as *Chanakya*, this text was written by Emperor Chandra Gupta Maurya's Prime Minister, Kautiliya, probably between 321 and 300 B.C. In his *Arthashastra*, Kautiliya designed a total system of government based on Vedic knowledge, covering everything from local administration and public health to the activities of secret agents. The text includes sections on agricultural settlement, planning, and infrastructure development; uses of non-agricultural land for forestry, pasture, and wildernesses for ascetic Veda-study; and the detailed duties of directors of agriculture and forest produce, and superintendents of cattle, horses, elephants, and pasture lands.

Manu⁸. To Westerners, the most striking feature of ancient Indian⁹ civilization was its humanity.

Such humanity prevailed because society was guided by supreme spirituality and, as an outcome of that, the country was prosperous. Neither did the fact of many wars serve to diminish the spirituality of the people, whether victors or vanquished. Spirituality and *rta*, the cosmic order, were the way of life of the people. They lived close to nature.

Panikker, seeing in the Vedic "experience" a vital role in alleviating the present-day human condition, believes that, as a matter of fact, Western culture, which has spread itself thinly over the entire planet, seems to destroy itself or fall prey to a death instinct (191). Yet other cultures appear powerless to contribute to solving, or at least easing, the human predicament of contemporary man.

The Vedas are like an ocean: one can find anything within them, and there are hundreds of books written about the Vedas by Western scholars alone. Each has written about what he or she was looking for in Veda. Some scholars seek its literary aspect. In this respect, it may be noted that the Vedic literature was composed by *kavirsis* who were inspired men and poets, *kavi* literally meaning "poet" in Sanskrit. A *kavi* is not a juggler with words as modern poets have all too often become, but a man "kindled with divine inspiration", "flame-tongued", "sun-eyed" like the gods, a seer with golden tongue who "gives voice to divine utterances whose truth lies in the illumination of which he is the recipient and the revealer" (169).

Since the Renaissance there has been no event of such global significance in the history of culture as the discovery of Sanskrit literature in the latter part of the eighteenth century -- the period when the West began discovering the East. Sir William Jones, who

⁸ Manu was the author of *Manusmriti*, the foremost code of sacred and civil conduct (*Dharma*). In *Manusmriti*, Manu prescribed each individual's duty in society in minute detail -- from the duties of a Hindu king, to the way people should treat the uneducated, the old, the crippled, the ugly, the poor, the lowly. *Manusmriti* is the main source of law in Nepal and India.

⁹ Whenever references to Vedic civilization or culture appears in an Indian context, they may be assumed to cover the Nepal context also.

is most credited with rediscovering Eastern culture for Westerners describes the Sanskrit language -- the language of Vedic literature -- as a wonderful structure, more perfect than the Greek, more perfect than the Latin, and more exquisitely refined than either. This "light from the orient", says Raghavan (212), directly led to the formulation of four important branches of scientific study in modern times: comparative philosophy, comparative mythology, comparative religion, and comparative literature. Raghavan draws an analogy between Vedic and modern, Western literature, and describes how Schopenhauer saw in the *Upanisads* both the solace of his life and the solace of his death. Emerson also sang of the *Braahmana* to T.S. Eliot and Aldous Huxley about the way in which influence of Indian thought on writers, critics, thinkers, and even scientists in the West had been steadily growing, so that for Sanskrit culture one could truly claim global significance at the present time.

The qualities of this culture become clearer as the content of various Vedas and Vedangas is analyzed in the following section.

Branches of the Vedas

The Vedas are so vast, not only in the profoundness of their knowledge, but in sheer quantity, that scholars have subdivided them into *Vedas*, *Vedanta* (which follow on from each Veda), *Vedanga* (literally "organs" of the Vedas), and *Veda Upanga* (*upa*, "extra", "organs"). The logic behind this subdivision appears to be to guide the Vedic scholar, or ordinary reader, lest he or she becomes literally lost in the complexity and detail of the literature. What appears important to understand is that there is a kind of progression through the Vedic texts. For example, after the most ancient text, the *Rigveda*, follows another text interpreting the *Rigveda's* meaning, and then another text explaining how to read the previous one, and so-on. For this reason, not just the original four Vedas, but the whole progression of literature from the *Rigveda* to the *Upanga Puranas* are referred to as "the Vedic literature", or the Vedas.

The four original Vedas are *Rig*, *Saam*, *Yajur*, and *Atharva*. Each of these varies in extent and scope. Thus, Patanjali (194), refers to 21 branches of *Rigveda*, 1,000

branches of Saamveda, 101 branches of Yajurveda, and 9 of Atharvaveda. Unfortunately, many of the original Vedic texts were destroyed especially during the centuries of Muslim rule of India. For this reason, of the one thousand branches of Saamveda mentioned in the old texts, the complete original text of only two branches are available now although scholars have mentioned the existence of material belonging to two other branches. Similarly, according to the old texts, the Krishna *Yajurveda* used to comprise eighty-six branches of verses and *Shukla* had fifteen. Now only four and two branches are available respectively. Likewise, only two out of nine branches of the *Atharvaveda* mentioned in the old texts exist today. It is not known how many *Vedic Upanisads* there may have been originally, but there are 108 texts preserved now.

Acharya (3) explains that each branch of a *Veda* is complete in itself. For example, a branch of the Rigveda is expected to be related to a branch of Saamveda, Yajurveda, and Atharvaveda, but is not expected to follow on from another branch of the Rigveda itself. Each of these branches always includes four main sections -- *Mantrasamhita*, *Brahmana*, *Aranyak*, and, *Upanisad*, and may include many more sections and organs (*Upanga*) such as *Dharmasastra*¹⁰.

The four main Vedas provide knowledge primarily about *Dharma* (right conduct or duty at each stage of life) and *Mokshya* ("salvation", or last stage of life), and about *Artha* and *Kaama*. *Artha* (literally, economics) in the Vedic sense involves the full, or proper, role of wealth for human progress, including responsibility for all manner of dependents as well as for spiritual or religious work which integrates growth and evolution and brings life to fullness. Maharishi Mahesh Yogi has clarified the Vedic

¹⁰ *Dharmasastra* are texts explaining the righteous conduct, or duty, of different categories of persons in society, such as student, teacher, father, mother, etc. *Dharmasutras* are the actual verses applicable to a certain category. As an example, the *Apastamba Dharmasutra* (IV, 25-29) advises a student to be "gentle, subdued, controlled in senses and shrinking from doing wrong, firm in his fortitude, neither lazy, irascible, nor jealous. He must, in private, bring to the teacher's notice any inadvertent or deliberate transgression of the rules of conduct on the teacher's part. To such a disciplined student, all the meritorious, sacrificial and household acts bear fruit in his studentship itself." *Manusmriti* is also one of the *Dharmasastras*.

meaning of economics(157):

Economics should not be restricted only to the integration of employer and employee, of buyer and seller. Economics is for life and life is too precious to be enclosed in the stock exchange. This partial, haphazard approach to economics should give way to an approach based on a more fundamental level, to an economics that integrates one field of life with another... There are three fields of life: the field of action, the field of thought, and the field of consciousness... Action is based on thought and thought is based on consciousness... Economics is for integration, but so far economics has been for integration only for the field of action and for the physical, material values. The depth of life remains untouched... The field of economics as a whole will only be fulfilled when it is able to integrate all aspects of individual life with all aspects of social life, and then integrate both of these with all aspects of national life and all aspects of international life... [This is] only a paradox for those who are not integrated in their awareness.

Kaama literally means "feeling", as of the senses. In the Vedic context, it refers to the proper institution of marriage and the raising of children.

Traditionally, Vedic knowledge has been imparted to students by means of a *gurukul* (one-to-one relationship between guru and student) education system specially designed for those *varna* (castes) who were traditionally understood to maintain purity of their social *dharma*, i.e., Brahmin, Kshatriya, and Vaishya caste children after the performance of their *upanayana* ceremony -- the sacred thread initiation into "twice-born" status, or spiritual re-birth.

One way to describe and analyze the Vedas is by reference to the four main sections of each branch of a Vedic text: *Mantras*, *Brahmanas*, *Aranyakas*, and *Upanisads*.

Mantras are the procedures for performing *yagyas* and the Vedic words¹¹ for performing *karma*, the actual rituals. *Yagya* loosely means "sacrifice", for example, of uncooked rice, unhusked barley, ghee, sesame and fruit to be consumed by *Agni*, fire, which is believed to transport the influences of the sacrifice to "heaven". The collection

¹¹ Again, the Vedic word *mantra* literally means "sound vibration to free the mind" (Adhikari).

of these mantras is called the *Mantrasamhita*, or, simply, the *Samhita*. Thus, the sections of all four Vedas which comprise only such mantras are known as the *Veda Samhita*.

Basically, the *Veda Samhita* are collections of hymns and prayers for reciting during religious sacrifices (*yagyas*). Of the four *Veda Samhitas*, the *Rigveda*¹² is the most important and ancient, different parts of it having been composed at different times over the centuries by different seers. The *Rigveda* is divided into ten *Mandalas* (books), each mandala consisting of *suktas* (hymns), and each *sukta* comprising many *mantras*. There are more than a thousand *suktas* in the entire *Rigveda* system of texts. The *mantras* were composed and handed down orally from generation to generation until they were brought together over the course of several hundred years. According to Santucci, the date of the *Rigveda* is impossible to determine with accuracy, particularly the chronology of the separate mandalas and hymns (230). The best estimate may be that the oldest hymns were composed between the eighteenth and thirteenth centuries B.C., and the more recent hymns around the tenth to ninth century B.C.

Saamveda is the knowledge of chants in lyrics, or "*saam*". The importance of *Saamveda* lies in the sacrificial and magical spheres, for the chants are believed to possess magical power (230).

The *Yajurveda* is a textbook of knowledge of formulae for conducting sacrifices.

Atharvaveda was composed mainly by the rishi Atharvan, and partly by Angiras. Thus, it is sometimes known in full as the *Atharvangirasah*. Its function is to inform people about common beliefs connected with daily life, and, as such, it comprises a collection of texts and hymns for use by family priests both as imprecations against such diseases as jaundice, leprosy, or blockage of the urinary tract, or against the evil influence of sorcerers, witches, demons, noxious animals, and enemies, and as hymns to exert positive influence for matrimonial happiness, protection, fame, concord, virile power, or the retention of sacred learning (230). Prominent in the texts is knowledge of medicine, philosophy, and agriculture. Acharya (3) mentions that some reformers

¹² Alternatively, *Rgveda*, pronounced *Rk*, with a rolled *R*.

advocated that Kings should always maintain in their court priests with knowledge of the Atharvaveda.

Brahmanas refer to both Vedic words, or *mantras*, themselves, and the collection of such words. All Vedas include a collection of *Brahmanas* which are *mantras* praising and explaining the significance of performing the various sacred rituals. Differences in *Brahmana* subject matter from one *Samhita* to another reflect differences in the duties of priests associated with the different *Samhitas*. Thus, the *Brahmanas* of the *Rigveda* specify the duties of the *Hotr* "invoker", or "offerer" -- the priest responsible for reciting the *Rks* (*Rigveda mantras*) suitable for the particular sacrifice. The *Brahmanas* of the *Samveda* confine themselves to the duties of the *Udgatre*, the singer or "cantor" of the chants. The *Brahmanas* of the *Yajurveda* concentrated on the duties of the *Adhvaryu*, the actual performer of the sacrifice, and the one who recites the *yajus*, or sacrificial prayers (230).

Vedanta (*Veda* plus *anta*, the "end" of *Veda*) are the third stage of texts in the Vedic literature consisting of the *Aranyakas* and the *Upanisads*. The *Upanisads* were also called the *Vedanta* not only to indicate their position textually, but in terms of their supreme importance as the acme and crown of Vedic knowledge.

Aranyaka literally mean "forest treatise", and were composed by seers who lived by meditating and performing sacrifices in the forest. They were intended for those at the stage in life of desiring to retire into the forest rather than to study at home with a guru performing rituals in the usual way. *Aranyakas* emphasize meditation more than sacrifice, with worship uplifted from the physical to the mental level (127).

There are *Upanisads* for each *Veda*. *Upa-ni-sad* literally means to "sit down near the guru devotedly" because, essentially, these texts comprise special instructions from teachers to their pupils. The *Upanisads* express eternal truth, explaining the nature of reality about *Brahman* (cosmic consciousness) and *Atman* (individual consciousness). Thus, their message is to explain the oneness of living being and God. They were communicated by illumined saints whose only purpose was to enlighten others and thereby relieve the suffering of humankind (132). The eighth century philosopher-sage,

Shankara, founder of the Shankaracharya tradition whose mission became to revitalize the Vedic tradition in every generation¹³, wrote commentaries on the main eight Upanisads.

The *Vedanga* (Sanskrit: *Veda* plus *Anga*, "branches") are an additional set of literature in the Vedas composed by the later *rishis*. The purpose of elaborating such separate texts was to clarify the structure of the Vedas and their uses and meaning. They are six in number:

1. *Shikshya* literally means "Education" in Sanskrit (and also in Nepali). This Vedanga explains the phonetic structure of the Vedas, i.e., how each syllable and word should be pronounced. *Shikshya* also refers to the general education that should be available in society. There are various texts within the Vedanga, each relating to one of the four Vedas. *Shikshya* may represent a progression towards teaching the Vedas to "others" interested in studying them.

2. *Kalpa* is an additional text from which to borrow formulae for pronunciation if these cannot be found in the main Vedas. The more than ten *kalpasastras* are essential texts prescribing the correct performance of *yagya* ceremonies.

3. *Vyaakarana* (literally, "grammar") teaches the relationship between phrases and sentences in the Vedic literature so that the mantras required for *yagyas* can be correctly understood. Panini's grammar is the oldest of these texts, but many others have been written in an effort to simplify the literature for general readers.

4. *Chhanda* (rhymes) *shastra* are four texts which explain exactly how Vedic verses should be chanted, and how to match *mantras* with one's voice.

5. *Nirukta* is a kind of dictionary designed to help readers understand the *Vyakarana*. In particular, the *Nirukta* texts explicate the relationship between the Vedas and the Vedic deities.

6. *Vedanga Jyotish* (Astrology) comprises two texts which explain the motions of the sun, moon, and other celestial bodies over time, i.e., in relation to the months, seasons, annual cycles, and "ages". In particular, *Jyotish* indicates the most advantageous

¹³ Maharishi Mahesh Yogi belongs to this tradition.

time for performing any kind of activity, and also how to avoid the negative influence of certain times or cosmic events.

There are six main categories of *Upanga*, *Upa* ("extra") *Anga* ("organs"), of which *Dharmasastra*, *Tarka* (logic), *Puraan*, *Ramayana*, and *Mahaabhaarata* are the most well known.

The *Puranas* are 18 in number and are especially familiar in Hindu family life, being composed in such a way as to be intelligible to listeners of any caste, and dealing with questions of life, death, evolution, and disasters. Essentially, their message is that maintaining harmony with nature (*rta*) and following good conduct in society leads to *Mokshya*, salvation. It is life not in accordance with *rta* that brings natural disasters that destroy the world.

In Nepal, it is common to see a *pandit* seated on a cushion reciting these texts in Sanskrit and explaining their meaning in Nepali. *Puran* rituals are usually performed in a household over a period of seven days. Their significance depends on the objective of the householder initiating their performance. There are *Puranas* designed for when a person wishes to express gratitude to God for their success or the blessing of some good event, and there are *Puranas* a person may perform after a family member has died so that the deceased's spirit may be aware of being remembered, and receive support towards reaching heaven.

Vedic knowledge

The insights of Vedic knowledge are understood to have been revealed to seers and saints while they were in a state of transcendental consciousness, or one-ness with God. During the Vedic period, the period when these insights were first revealed, these same seers and saints were the only teachers of this knowledge. At that time, therefore, it can be said that the knowledge and insights about any aspect of life and the universe that was revealed to those seers had suffered no distortion. Followers of the Vedic tradition believe this represents true knowledge, and it is this knowledge, rather than any different or more recent interpretation of it, that is of interest in this study. Contemporary Nepali

Vedic pandits are categorical about some modern Western scholars of religion who hold contradictory interpretations of Vedic knowledge, calling them "enemies of Vedic knowledge". Their comments follow later.

What, then, is the nature of Vedic knowledge, and how was it revealed? Miller (169) refers to Indian philosophical schools which recognize at least three means, or *pramaanas*, to valid knowledge: perception (*pratyaksa*), inference (*anumaana*), and verbal testimony (*sabda*) or revelation (*sruti*).

According to Miller, the testimony of the Vedas is concerned with the last of these means, namely *sruti*. Some Indian logicians reject *sabda*, verbal testimony, as a means of knowledge on the grounds that *sabda* can only be accepted if based upon the first two methods of apprehension, perception and inference, which form the basis of daily experience. But knowledge, it was found, cannot be restricted merely to the senses, or direct perception and reason, as the only source at our disposal. For these do not exhaust the whole content of human experience. Therefore, some schools of Indian philosophy recognized intuition or spiritual insight as a means of knowledge -- a unique *pramanaa* -- differing from the others, yet valid in itself. The Vedas, based upon extraordinary means of knowledge -- in fact, upon the intuitive vision of seers -- was put forward as an acceptable source of knowledge.

The authority of the Vedas stems not just from the testimony of one *rishi*, but of generations of seers. In fact, the testimony can be traced to a long line of sages. Miller further explains that the *rishis'* means of apprehension are twofold: visioning, and contemplation. Visioning may mean receiving knowledge as in a flash and thereby intuitively knowing. Or it may mean "seeing" certain realities beyond the world of senses. In either case, the means imply direct apprehension of certain truths that do not fall within the field of ordinary human sensual experience. Contemplation implies meditation, the steady focusing of inner insight, or consciousness, upon a particular object or idea or vision. Intellectual inferences and logical deductions do play their part, but they are secondary and only offer means for explaining and expanding upon what has been seen or discovered in a supra-mental state of consciousness.

To achieve the right kind of knowledge about an object, one has to possess the right quality of understanding. Inspiration to have right knowledge is understood as the gift of the Goddess of wisdom, Saraswati. Once inspired, the Veda prescribes certain specific prayers which assist attainment of right understanding. One such prayer is translated here¹⁴:

*We offer our adoration to thee, O Goddess of understanding
Be favorable unto us
Be gracious unto us
Be Thou ever beneficent
Mayest Thou reveal unto us the innermost of all truth
Even if perchance we be engaged in actions and thoughts not enjoined by the
scriptures and inimical to realization of the Supreme God, withhold not Thy grace
Being favored by Thee, may we remain true to the spiritual ideals taught by the
Veda
May we, as worthy disciples, perform selfless actions, and, thus purified, may we
dwell in the supreme Brahman
By Thy grace, O Mother, a man can attain the knowledge of Brahman; Or he can
attain the position of Brahma;
Or he can find glory, or win untold riches.
Favor us with well-being, O Goddess.
May Indra grant me right understanding.
May the Goddess of Wisdom grant me right understanding.
May the twin gods garlanded with lotus flowers grant me right understanding
The right understanding that is in the celestial maidens
The right understanding possessed by the heavenly singers
The right understanding that belongs to the great gods
The right understanding that is in the knowers of the Vedic lore
May that right understanding dwell in me, and make my life sweet and fragrant
Yajurveda, Taitterai Aryanka, x,39-42*

Only after attaining right understanding about the purpose of knowledge can an individual set his mind towards attaining the knowledge of the supreme seers, which is

¹⁴ As noted earlier, it should be emphasized that translation of Vedic *mantras* into English loses the "vibrant quality" of the original *Sanskrit Devanagari*.

Translations of Vedic texts are taken from Pokhrel's (200) and Acharya's (3) Nepali writings and books, and from Jean LeMee's "Hymns from the RigVeda" (152) and Jaggi (127).

understood to be knowledge of *Brahman*, the Creator of the Universe. To be receptive towards this influence of knowledge, the person has to meditate, concentrate on the object of interest, and contemplate the vision received. If contemplation enables the person to clearly explain his insight, this represents the knowledge he gained about the object of interest, and that knowledge is recorded without any distortion either in writing or by oral transmission. This knowledge is understood to be pure. Any person who gains this quality of pure knowledge through successfully learning the prescribed processes is a *rishi*.

Some of the Vedic *mantras* used to attain the knowledge of *Brahman* translate as follows:

*I take refuge in Thee, O Lord
 Thou dost deliver man from the bondage of birth and rebirth
 I bow down to Thee.
 Lead me not into the wheel of birth and rebirth, but guide me over to the shore of
 immortality
 My obeisance to Thee
 I bow down to Thee O Lord
 Thou art the ancient one. I bow down to Thee
 Thou are supreme. I bow down to Thee
 Thou art mighty. I bow down to Thee.
 Thou art the Word that is in the beginning. I bow down to thee.
 Thou art the source of strength. I bow down to Thee.
 Thou art the subduer of the tyrant. I bow down to Thee.
 Thou art the ruler of all beings. I bow down to Thee.
 Thou art the ruler of the mind. I bow down to Thee
 Yajurveda, Taitt. Aranyaka x,43-47.*

In the Rigveda, there is a whole section of "*mantras* of the word of knowledge..."

...which tells of the origin, development, and flowering of the most astonishing monument ever designed by the mind, chiseled out of the verbal substance -- the Sanskrit language; it tells of the supreme aim of human existence -- the realization of the absolute nature of Man through knowledge by the power of word (152).

Two stanzas from this section of the Rigveda translate:

*All companions are given both eyes and ears,
 But each man differs in his quickness of mind.
 There are some who are like deep refreshing lakes,
 And yet others like shallow pools of water.*

*When men of the word, companions, worship
In their hearts refining flashes of insight
Then some become fully conscious of knowledge,
While others go their way mouthing empty words.*

Rigveda X, 71.7-8

These stanzas confirm that anyone may become a *rishi* provided he or she can attain the knowledge of *Brahman* which is represented by *Saraswati*, the Goddess of wisdom, and *Brihaspati*, the word of God. By this, it is understood that pure Vedic knowledge flows from the combination of two influences, male and female.

The Vedic mantras personify every element in the universe as a living being. The hymn to the Dawn in the Rigveda captures the ancient people's fine and deep feeling, or reverence, for nature. LeMee explains how the Divine "Daughter of Heaven" is not just the poetic personification of the rising sun. She is the kindling of Divine Fire, of the Divine Will, the dawning of the light of Truth in the hearts and minds of men, bringing in her wake abundance of cows, horses, and chariots -- that is, knowledge, strength, energy, and health (152). It is worth quoting some stanzas from this hymn from the Rigveda:

*Like a youthful maiden, Dawn shines brightly forth,
Stirring to motion every living creature.
Divine Fire was kindled for the use of men;
Dawn created light, driving away the dark.*

*Illumine us with your glorious splendor,
O divine Dawn! Enrich and strengthen our lives,
O Goddess full of Grace! Grant us fulfillment
And cows, horses, and chariots in abundance!*

*O daughter of Heaven, Dawn of noble birth,
Whom the men of glory celebrate in hymns,
Establish in us wealth sublime and mighty!
O Gods, protect us always with your blessings.*

RV VII, 77, 1,5,6 transl. LeMee(152)

The *rishis'* efforts to learn were humble acts of surrender to God and constant seeking of His blessings until they attained the level of enlightenment. During the long process of devotion, meditation, and contemplation, they were very aware that there

could be obstacles preventing their attainment of pure knowledge. Spiritual devotion to right understanding and knowledge was seen as inseparable from cosmic revelation. This is the meaning of the following *mantra* translated from the *Yajurveda*:

*May I attain Brahman through right understanding
 May I attain the Supreme Joy through right understanding
 May I attain Brahman, the Supreme Joy, through right understanding
 Which enables one to grasp the truth of the great saying
 as it is imparted by guru.
 O inspirer of right understanding, grant us, who are spiritual aspirants, the good
 fortune to become illumined teachers with many disciples and followers.
 Remove our evil dream of duality.
 Wipe out all sins that obstruct the path of right knowledge.
 Grant us the knowledge of Truth which is beyond all doubts and misconceptions.
 May the wind blow sweetly,
 May the rivers flow sweetly,
 May the plants and herbs be sweet to us,
 May days and nights be sweet to us,
 May the heaven that protects us be sweet to us,
 May the trees be sweet to us,
 May the sun shine on us sweetly,
 May the cows yield us sweet milk.
 Selfless service leads to the knowledge of Brahman.
 Selfless service leads to the supreme joy.*

Yajurveda, Taitta Ar. 49-50

The culmination of vision appears to have been absorption into a transcendental state of being which has been described in various ways. In such a heightened state of illumination, the *rishis* fathomed and developed their conception of the cosmic order. Their claim not only to knowledge of the laws of the universe and their understanding and application to daily social norms, but also to knowledge as to how best to bring these visions forward to consciousness and express them as divine utterances is thus founded on that "revelation" which comes to man through "visioning". The latter is an opening up to, and a penetration into, the deepest structure of the macrocosm, and by repercussion, the microcosm (169).

Socio-culture

The previous section described the process of attaining what is understood to be

pure knowledge. This pure knowledge has been reflected in society and in culture, and, in many instances, it is clear that it has not only been reflected but further evolved and elaborated in response to changing conditions.

Again and again, Vedic literature emphasizes *rta*, or supreme harmony, as the guiding principle of society, based on the visions the rishis received, through their meditation, about how to maintain society in supreme harmony without sin or dividedness. Good conduct, devotion to God, and equality of treatment for the peaceful co-existence of all in society were the main guiding principles of Vedic literature¹⁵.

Pandit Pokhrel states that, contrary to the efforts of some Western scholars to distort Vedic ideals, there was no trace, in Vedic society, of any practice such as slavery, child marriage, the *sati* system (self-immolation by a widow in her husband's funeral pyre), or the restriction of Vedic study to Brahmins. Of course, individual Brahmins have since had a vested interest in interpreting the Vedas in a distorted manner. However, referring to the last three *mantras* of the epilogue to the Rigveda and the last seventeen *mantras* of chapter 40 of the Yajurveda, Pt. Pokhrel (201) cites the gist of the *mantras* as, "*Samanamastu wo Manoyathaa wo Susahasati*", which means, "Only by treating others equally can you live in co-existence." He even goes as far as to claim that the theory of co-existence adopted by the United Nations today is inspired by Vedic teaching.

Based on *rta*, strict moral codes were prescribed because the whole emphasis of Vedic culture was to make each person conscious. Vedic culture assumes that a conscious person will follow moral codes word for word, in full awareness that "sinful" transgression of the code would result in degrading of social status, an aspect of Hindu society which is discussed further below.

Loyalty is highly praised in Vedic culture, and is expressed in the importance given to sharing as an expression of friendship, as well as the concept of offering always the best that one has when worshipping deities to express one's loyalty to God. Failure to conduct any ritual in this manner, or spirit, will fail to invoke the deity. Persons who

¹⁵ From *Yajurveda*, last chapter, 17 *mantras*; *Rigveda*, last chapter, 3 *mantras*.

have not shared in the prescribed way will then "cease to hear the word" (169). Rigveda (X 71.6) emphasizes this when it states that "he who transgresses in any way the path of order ceases to be part of the divine harmony and fails to hear the divine words".

Rigveda (X 117.1-6) also stresses that especially the rich in society must share their food with the needy. But, equally it condemns the lazy in society who eat other people's food without any feeling of guilt when they have not contributed anything in the way of fruitful labor. However, hatred is considered wrong even if directed towards an enemy. This is because it is divisive and therefore works against harmony and *rta* (Rigveda V 85.7).

Harmony can be maintained as long as people are truthful. Man's stand on truth, his inborn sense of fairness, justice, and his acting and living in accordance with his "truth", is his human expression of "the great law", cosmic order (169). "Speak the truth, act the truth, never swerve from the truth" (*Taitt. Upanisad* 1.11.1) is the essence of the Vedic vision of creating harmony in society. On the interrelationship among harmony, truth, and human law, Miller concludes that there are many kinds of law among peoples, but that ultimately there is only one supreme law which is harmony, a constant inner adjustment of all parts to achieve balance -- the mirror of cosmic harmony. Anything that contravenes that law is separate and conflicting and breeds discord, suffering, and evil. Harmony is right, and therefore true; it is the divine truth. Disharmony is wrong, and therefore false; it is a distortion of the divine order. Law and truth find their meeting point in their ultimate basis, which is harmony. Truth is the basis of ideal law, the "Celestial *rta*", and harmony is the basis of both law and truth.

Founded in the *rta* concept, the Vedic structure of society is based on *Varnaashram Dharma*, the system or concept whereby every *varna* has his or her own duty to perform in society. To understand *Varnaashram Dharma* properly, it must be remembered that creating harmony in society was the main theme of the Vedic social system. To this end, the rights and duties of every *varna* were prescribed, and people were free to choose among *varnas* according to their preference. Vedic formulae also existed permitting anyone to follow another *varna*'s duty, or *dharma*, provided specific

purification rites were performed afterwards which opened the way for a return to own *varna* and restoration of balance in society. In case purification as prescribed was not done, the social repercussion was degradation of *varna* status.

Some Western scholars attack "*varna*" as denoting caste. In fact, the word "*varna*" does not mean "caste" and has never meant "caste" "by which convenient word it is often loosely translated" (21). The currently recognized caste groups in Hindu society are originally mentioned and defined in the Vedas in terms of their level of understanding of knowledge and the type of profession chosen. Thus, Rigveda's *Purush Sukta* (10.90.12) describes how from the mouth of a suprahuman being came *Brahman*, from his arms came the *Kshatriya*, from his thighs came the *Vaishya*, and from his feet, the *Shudra*. To guide each in following their respective *varna* certain duties were prescribed.

The duty of *Kshatriyas* was to rule society according to the texts, maintain right conduct, and to fight wars directed towards the perishing of evildoers. *Vaishya dharma* was business, including agriculture.

For *Brahmins*¹⁶, the main duty prescribed by almost all texts is to study the Vedas, to perform *yagya*, to help others to perform *yagya*, to do good to all, to follow good conduct, and to constantly practice the techniques of maintaining consciousness (*Satpath Brahmana* 11.5.7.1.). These duties are strictly imposed on Brahmins, and, to this day, teaching the Vedas and performing *yagyas* is their main profession based on the assumption that Brahmins develop the most understanding and practice of techniques of consciousness which, as discussed above, impart pure knowledge and insight.

Various levels of Brahmins are distinguished according to their *karma*, or performance of action (*Mahaabhaarata* 76; *Attri Smriti* 377-323). There are at least thirteen such levels or categories, of which the ninth level is the *Shudra* Brahmin, or *Shudra*, who are referred to as "untouchables" in Hindu society today. Even below the

¹⁶ The word *Brahmin* is the English pronunciation of the Sanskrit word *Brahman*. *Brahman varna* people were supposed to possess the knowledge and consciousness of *Brahma*, the Creator.

Shudra level are four more levels of "degraded" Brahmin. Acharya (3) refers to these lowest levels as "*Mlechha*", or "animal-like Brahmins", whom he characterizes as being "without any hesitation in mind, who introduce disturbance in common wells, lakes, gardens, and parks." Interestingly, *Mlechha* is a term used even now in Nepal and India to refer to Western, white-skinned people. Whether, during the (more probably) later Vedic period, it became known that Europeans had done something bad to earn this categorization, or would indeed later "disrupt" indigenous common property management systems, is an interesting question.

Shudras are not included in Vedic study not in any spirit of personal discrimination but because of their "conduct". To study and understand the Vedas is very difficult and, at the same time, very significant. The concept is that if someone of bad conduct, who is unable to concentrate properly, enters the collective consciousness of this system of learning, its whole environment becomes polluted. However, if the conduct even of a *Shudra* is Brahminic, the *Shudra* can be included (201).

For the *Vaishya varna*, agriculture, animal husbandry, and business with farmers were the main professions. However, farming as such was common to all *varnas* (*Manusmriti* 10.99.100; *Mahaabhaarata* 294.4), following the allowance in the texts that Brahmin, Kshatriya, and *Shudra* should practice farming if they were unable to make sufficient living from their respective *varna* profession. Similarly, if necessary, any *varna* could engage in *Shudra* occupations such as carpentry or other artisinal crafts (3).

Manusmriti (2.109), the *Mahaabhaarata* (122.13), and the *Gautama Dharma Sutra* (2.1.4) all mention that one can earn money by imparting knowledge to others. However, besides upholding the Vedic tradition by teaching, a Brahmin, if his primary profession yielded insufficiently to cover his living expenses, could follow agriculture as a secondary profession (*Paarashar Smriti* 212; *Gautama Dharma Shastra* 2.1.5-6; *Mahaabhaarata* 294.3).

For agriculture, three branches of the Vedas became very important. These were the *Vedangas* of *Jyotish*, *Ayurveda*, and the *Karmakaanda* texts for priests. The following notes on *Jyotish* and *Ayurveda* provide background for understanding the responses of

astrologers and Ayurvedic physicians to this study's interviews.

Astrology

The relationship of astrology to agriculture starts from the time when farmers have to be watchful for the rains, as rainfall prediction involves interpretation of clouds. The science of meteorology, based on astrology, was developed by sages like Gorga, Parasara, Kasapa, Rsiputra, and Siddhasena (35). It is written: "The prediction of an astrologer, who observes attentively day and night, the symptoms of pregnancy of the clouds, will never be falsified; like that of a sage when he determines the rainfall" (*Brhat Samhita*, 21.3).

Bhat states that all the scriptures beginning from the Vedas and Upanisads proclaim that food, personified as full of life itself, is the supreme "being" for the majority of human beings, and as Kalidesh¹⁷ writes, the highest spiritual experience cannot be achieved without a sound body which, of course, is built up and maintained by proper, *sattvika*¹⁸ food. This food can be had only if the monsoon is effective.

Thus, as food forms the very life of living beings, and as food is dependent on the monsoon, the monsoon should be investigated carefully (*Brhat Samhita* 21.1). It is the task of astrology to investigate, and one whole chapter of the *Brhat Samhita* is devoted to knowledge of the "pregnancy of clouds". An excerpt of this knowledge follows:

¹⁷ Kalidesh was an Indian poet of ancient times, and author of the world-famous epic, *Shakuntala*.

¹⁸ Vedic knowledge distinguishes three aspects of nature and man -- mind, vital, and body - which have different natures, or *gunas*, called *Sattwa*, *Rajas*, and *Tamas*. *Sattwa* is the quality of knowledge, harmony, and truth. *Rajas* is the quality of desire, action, and passion. *Tamas* is the quality of inertia and obscurity. Similarly, foods are classified into three categories -- *sattvika*, *rajasik*, and *tamasik*. *Sattvik* food is pure vegetarian, gentle and mild, and, as it is believed to enliven consciousness, is regarded as fit for *yogis* and seers. *Rajasik* foods, violently sour, hot, and pungent items that create heat in the body, enliven passion and energy, but spoil the health. They include meat, strong pickles, and liquor. *Tamasik* food dulls the senses -- cold, impure, stale food without taste or virtue (6).

The symptoms of pregnancy of clouds are to be detected when the moon passes through the asterism *Purvaasaadha*, beginning from the first day of the bright (moon) fortnight of the *Margasirsa* month (21.6). Promising symptoms of the conception of clouds may then be detected such as: a delightful and cool breeze from the north, north-east, or east; a clear sky; the sun and the moon encircled by a glossy, bright, and thick halo; the sky covered with large, bulky, smooth, needle-like, or razor-like red clouds, or having the color of crows' eggs (i.e., bluish) or of the peacock's neck, with the moon and stars shining brightly; an auspicious twilight -- morning or evening -- accompanied by a rainbow, good rumbling of thunder, lightning, and a mock sun; groups of birds and animals crying pleasantly in the north, north-east, or east, and not facing the sun; the planets being large, beaming brightly, and moving to the north of the asterisms and unhurt; trees with their sprouts unimpaired, and men and quadrupeds happy. These symptoms nourish all the embryos (21.18).

Bhatt (35), quoting from the sloka of sage Vasistha, also describes the good symptoms of raincloud pregnancy:

The days of retention of the embryo will be efficacious if they are accompanied by lightning, water drops, dust storms, and the luminaries [being] hidden by clouds. If there are beautiful flashes of lightning emanating from the auspicious quarter (east, north, and north-east), a wise astrologer should predict very good growth of all crops. If there be rain with dust storms, or if children be engaged in happy sports, the cries of birds be pleasant and their sport be in dust, water, and the like; if the luminaries be surrounded by halos that are glossy and not broken, then too there would be good rain helping the growth of all crops. If the cloud be glossy, collected together, and moving in a clockwise manner, there would be heavy rains tending to the growth of all crops.

According to Vedic astrology, heavy rains and floods are due to miscarriage of the foetuses of clouds. The texts strongly suggest that astrologers can predict such events far ahead of time so that people can take appropriate precautions by, if necessary, reducing or adjusting the planting of crops. They also suggest that crop planting can be delayed if such an event is anticipated. As the text states, "one astrologer should judge the quality of the rainfall as well as the good and bad effects thereof" (23.1). These texts even provide the technique for forecasting the quantity of anticipated rainfall. Only after determining expected rainfall do they suggest farmers prepare their seeds.

Various astrologers of ancient periods have also offered their predictions about the growth of crops and even pricing of agricultural products. One such system of prediction

was offered by Sage Badarayana. This system for predicting the growth of summer and autumnal crops was based on the planetary positions with reference to the ascendant at the time of the sun's entry into Scorpio. The system is quite technical, but appears highly relevant to agriculture.

As usual, this sage's insights are composed in lyrical *mantras*. They explain:

If at the time of the sun's entry into scorpio, the *kendras* (angles) from him are occupied by benefics, or if he is aspected (or conjoined with) strong benefics, summer crops will flourish splendidly.

When the sun tenants Scorpio, and Jupiter and the Moon, Aquarius and Leo, or vice versa, summer crops will prosper.

When Venus or Mercury or both are posited in the second or twelfth house from the sun in Scorpio, summer crops will grow well. If, in addition, the sun be aspected by Jupiter, there would be bumper crops.

When Scorpio is surrounded by benefics, i.e., Mercury and Venus, and when the seventh house from the sun, i.e., Taurus, is occupied by Jupiter and the Moon, there will be excellent growth of corn.

When the Sun occupies the initial part of Scorpio and Jupiter the second house therefrom, the growth will be only half (no. 1-5).

The sun occupying Scorpio, being surrounded by malefics on both sides, destroys crops. If there is a malefic in the seventh house, crops would be destroyed even though they may grow well.

A malefic in the second house from Scorpio, being unaspected by benefics, will destroy the crops sown first; but will enable those sown subsequently to thrive well.

Two malefics, viz. Mars and Saturn, occupying the seventh and any other angular house from the sun in Scorpio will destroy the crops; and if they be aspected by benefics, they would not destroy corn completely or everywhere.

Where the two malefics occupy the sixth and seventh houses from the sun in Scorpio, there will be good growth of crops, but their prices will slump (8-11).

When the sun moves through Aries, Taurus, or Gemini in conjunction with or being aspected by benefics, summer crops will fetch a good price, will be free from pests, and will be entirely useful (13).

The Ayurveda

The term Ayurveda derives from the Sanskrit roots *Ayu*, "life", and *Veda*, science of knowledge. Ayurveda is therefore referred to by its practitioners as "the science of life". It contains the fields of botany, biology, herbology, anatomy, nutrition, hygiene,

medicine, and surgery (4). The origin of this branch of Vedic knowledge is very ancient indeed. It appears in an elaborated form in the *Atharvaveda*, but it is mentioned even in the *Rigveda*. Ayurveda is also believed to have been revealed to *Rishi* Dhanvantri, possibly at the time of the *Rigveda* or *Atharvaveda*. The oldest and most authoritative commentaries on the Ayurveda are the *Samhitas* of Charaka and Sushruta.

Ayurveda is a classic example of *shastra*, or revealed, knowledge. Agarwal (6) describes how *Rishi* Dhanvantri wrote about the qualities and actions of countless herbs not from knowledge obtained through laboratory experimentation, but through his *intuition*. "When he wanted to know the particulars of a certain herb, he sprinkled water on it with some *mantra*. The plant soon revealed its qualities and actions to the inner eye of the *Rishi*" (p.11). Adhikari (4,p.1) explains that Ayurveda, being revealed knowledge, "is not subject to the imperfections and inaccuracies of western or empirical, medical science... It is a perfect science." However, Agarwal points out (6):

Today the ancient medicine is in a deplorable condition because its followers have forgotten the spiritual idealism and intuitive faculty and are under the influence of materialistic ideas. The result is that spiritually they have become stagnant and have lost the creative genius. They have lost the true interpretation and application of Ayurvedic principles... and this profound, simple system of medicine has become very confusing to the modern mind (p.1).

Similarly, Adhikari writes (4):

Just as in the case of spiritual knowledge, without a disciplic succession, the science appears to be lost. Whatever limitations that may be detected in the application of the Ayurvedic science today are due to this fact (p.vii).

It is important to acknowledge the source of Ayurveda within the cosmological framework of the *Rigveda*. This is because the *Rigvedic* people considered natural and cosmic forces as gods and goddesses, and that it was these gods' and goddess' influence, or failure to maintain *rita*, which was the main cause of any health imbalance or injury. Equally, these same forces played a role in healing and cure, and it was therefore the responsibility of every individual to observe the prescribed rules to placate these influences and maintain health. The basic emphasis of Ayurveda is, therefore, that individuals be viewed in their totality of mind-body-spirit and in their subtle relationship

with the universe. Adhikari explains this spiritual dimension of health as seen in Ayurveda (4,p.83):

In the *Sutra Sthan* section, Sushruta says that health exists when three factors are present. First, all the *doshas* should be in proper balance. Second, all the senses must be in good working order. And third, the soul must be blissful. From this definition, it is obvious that only a *sadhu*, or saintly person, can be considered healthy.

For this reason, Adhikari writes that a good doctor must have spiritual as well as medical knowledge, and cites Vedic texts as distinguishing three types of doctors, those practicing with the aid of knife, with the aid of plants, and with the aid of the holy word (*mantra*), "the last being the most esteemed" (p.85).

The central idea of Ayurveda is that it is Nature, or Energy, which heals, and that it is the task of the physician to awaken and properly adjust this energy of healing in the patient. Essentially, Vedic knowledge reveals that the body is composed of the five *mahaabhutas*, or gross elements, of material energy in nature: earth, water, fire, air, and ether. As Agarwal explains (6):

It is quite simple to understand; one eats food, drinks water, enjoys the sun, breathes the air, and is alive due to the presence of ether or life-force. This life-force is the basis for man's mental and spiritual activities so that Nature may evolve him towards perfection. The function of each element is different. The earth gives shape to the body and releases its energy... Water makes the earth supple and helps in the transmission of energy...without which the body would become a dry and rigid mass. Fire makes the form of the body steady and gives vigor and stimulation; digestion and circulation represent it. Air ignites the fire and works as a life carrier and is the support of all contact and exchange... Ether is the creator of life itself in the body. A harmonious combination and function of these five elements produce a healthy and beautiful body (pp2-3).

The *mahaabhutas* are shaped according to the modes of nature a person has acquired. The three modes of material nature, *sattva*, *rajas*, and *tamas*, mix with the five gross elements to form subtle energy principles, which Ayurveda calls *tri-dosha*. It is the *tri-dosha* that is responsible for the particular nature, or *prakriti*, of each person's body (4). Since the Atharvaveda, people had thought of a three-fold classification of all diseases, viz. those produced by wind, by water, and by fire, dryness or burning. This classification corresponds to one that came later which saw all physiological processes

and disease status as being a reflection of the three *doshas*, or energy principles: *Vata*, or *vaayu*; *Pitta*, and *Kapha*. Adhikari notes how these terms have been translated into English as air/wind, bile, and mucus, but they are not these substances. Rather, they are the energy principles that help produce and distribute these and other substances to keep the body fit (4). Thus, *Vata* is "life energy", *Pitta* is "heat energy", and *Kapha* is the "solid energy principle". As Agarwal explains, "There is multi-significance of each term in order to pack as much meaning as possible into a single word. This makes it very difficult to understand at first sight" (6,p.4). Until today, the main concept of illness according to Ayurveda relates to imbalances of these three *doshas*, and cure is obtained by arranging for the *doshas* to return in balance chiefly through adjustment of diet.

Bodeker (38) explains the notion of physiological "balance", or homeostasis, that is the basic concept in *tri dosha* theory. The *dosha* elements are considered to be present in differing degrees and proportions in different individuals. A "balanced" physiology, in this theory, is not necessarily one in which all three elements are present in equal proportions. Rather, by way of analogy, in the same manner that the DNA contains the blueprint of the individual's genetic makeup, and RNA reflects the current status of the expression of that blueprint, the basic *prakriti*, nature, of an individual is understood in Ayurvedic terms to be the blueprint of physiological structure and potential. On the other hand, the *current state* of *doshic* balance is understood to reflect the effects of environment, diet, life experience, etc. on the expression of the basic *prakriti*.

Ayurveda is the science of health, and health, as stated by Kalidash, is enhanced by eating *sattvik* food. To enjoy a *sattvik* diet, the starting point is to plant those food crops which form the basis for good health. Considering the relationship of Ayurveda with the plant kingdom, it is apparent that Vedic agriculture and Ayurveda were related on at least two levels. Firstly, Vedic agriculture was guided by Ayurvedic principles indicating dietary requirements for keeping the body healthy to prevent disease. Secondly, Ayurveda also prescribed types of herbs that should be cultivated to cure diseases, and herb cultivation was an integral part of agriculture.

Ayurveda teaches that subtle changes affect the physiology during different phases

of each day, not to mention seasonal changes and all the effects of climate, locality, and cosmic influences. In an Ayurvedic framework, the physiological effects of these changes manifest as *dosha* imbalances which can be corrected by specific attention to diet as well as through herbal treatment and yogic techniques. Adhikari (4) explains how the central Ayurvedic concept of *dosha prakriti*, or energy principles in nature, apply equally to the nature of a particular body as to the nature of an environment, a substance, or disease. He continues (pp59-60):

Although they are not known as such or accepted by Western medicine, these *doshas* exist throughout the material nature as a transformation of the three modes of nature... Remembering that *Vata dosha* refers to the life airs, *Pitta dosha* the principle of heat energy, and *Kapha dosha* to the principle of solid substance, we can understand that changes in environment also change the balance of the *doshas*. The Ayurveda analyzes everything according to this concept.

For example, a mountain region has a predominance of *Vata dosha* in the air, a seaside has a predominance of *Kapha dosha* in the air, while a desert has *Pitta dosha* predominant in its atmosphere. Similarly, well-water is mainly *kaphaj*, rain water is mainly *vatic*, and river water is more *paitic* in nature.

The times of the day, based on the sun's position in relation to the earth, also affect the *doshas*. Just before sunrise, for the *brahma-muhurta* hour and thirty-six minutes, is the time of the day when all the *doshas* are equally balanced. Ayurveda says that this is the best time for *yoga sadhana*, the practice of *yoga* or devotional service. The morning from sunrise until noon is the best time for activity. During this time, *Vata dosha* can be controlled. From noon till around 4 p.m. *Pitta dosha* increases. This is the best time to eat the main meal... From 4 p.m. to 7 p.m. *Kapha dosha* increases. One should not sleep during this time. After 7 p.m. until next morning, *Vata dosha* increases. One should be less active, take warm drinks or a very light meal, and take rest... Knowing these things, an experienced person can adjust his activities and environment according to the individual nature of his body. A good physician can manipulate these factors.

The subtle way in which environment, climate, weather, season, and time of day are understood in Ayurveda to contain different *doshas* clearly relates to the Vedic concept of culture discussed in chapter 2 (cf.158).

The way that Ayurveda maintains *dosha* balance through seasonal and time changes and the influences of environment, travel, and all other interactions is through its understanding of nutrition in terms of *rasas* and *gunas* -- tastes and qualities. Ayurvedic

dietetics, and the way in which the ten *gunas* in each food interact with its *rasa* to determine its effect on the physiology, is a vast field. Even the concept of "taste" is far more complex than simply the sweet, sour, alkaline, pungent, bitter, or astringent taste that is felt on the tongue. There are also extensive rules covering the manner in which foods are prepared and eaten, right down to the number of times foods with different *doshas* should be chewed before swallowing. Suffice it to say that the "science of life" contains knowledge on the ideal foods to be taken to enhance health in any environment, season, or condition. Ayurvedic knowledge of the qualities of different food crops, as well as herbs, and their use in all manner of health conditions is simply vast.

Ayurvedic physicians also classify herbs within a *vata - pitta - kapha* framework, and their efficiency is understood in terms of their effect on the various levels, or *koshas*, of the physiology. One of the levels is the *prana* level of energy flow or life force which is also accessible through many *marma* points on the body surface, a principle used in classical Chinese acupuncture. In effect, the preparation of Ayurvedic herbs includes an essential spiritual element which allows healing to take place on very subtle levels of the physiology. The reason why indigenous cultures recognize the sacred in nature is explicated within this framework as knowledge and understanding of these energy flows, i.e., within plants and between them and their surrounding ecosystem. Even the time of picking herbs is important. Ayurvedic practitioners believe that the full moon influences the flow of *soma* energy to produce the maximum quality of *sattwa*, goodness or spiritual purity, in the plant. Similar reasoning explains the performance of specific rites and ceremonies at the times indicated as ideal for picking. *Jyotish* experts and *pandits* may be involved in advising on special preparations.

The extent of medical knowledge even during ancient Vedic times can be seen from the *Atharvaveda* which mentions the names of a number of diseases, including fever, cholera, diabetes, epilepsy, heart disease, jaundice, leprosy, dropsy, worm infestation (in cows and horses as well as humans), and diseases of the head, ear, nose, throat, eyes, and neck. It also mentions other specific infectious and incurable diseases. The *Atharvaveda*'s *mantras* were uttered and utilized for various purposes (127). In

addition to depending on incantation of magical verses to bring about cure, "they used empirically or even rationally different herbals, their products and concoctions" (ibid).

The *Atharvaveda* (11.9.3) mentions hundreds of medical practitioners and thousands of herbals. By that time, herbal doctors had developed confidence in the effectiveness of their drugs, and this kind of practice gained ground gradually and culminated in the establishment of classical Ayurvedic medicine (ibid). Causes of disease were always related to natural imbalances which occurred either by eating the wrong food, that is during the wrong season or time, or through committing sin which was also related to not maintaining "harmony" in nature.

For the treatment of diseases, the help of different herbs and their concoctions was sought, not only for internal use, but also by the wearing of amulets made from them (ibid). There are many *mantras* in the *Rigveda* and *Atharvaveda* devoted to praising the virtues of different plants and indicating their specific uses for specific conditions. Below follow some translated Rigvedic hymns used by the physicians of that time, *bhisaja*, in praise of medicinal plants while using them to cure their patients (127).

*These herbs, the first-born of the gods,
Three ages of the world ago,
These will I worship in my thought,
The hundred-and-seven virtues of these
(With new) tawny (sprouts) (1)*

*Hundred, O Mothers, are your virtues,
and thousand your shoots,
Ye of hundred potencies, then,
make me heal this man. (2)*

*Rejoicing, herbs, respond,
Ye with flowers, ye with shoots,
like mares winning the race
eager, the plants to ferry over to the side of safety (3).*

*Herbs -- thus I address you, mothers, goddess,
May I win horse, cow, clothes
...thy life spirit (atman) Omen! (4)*

Flying down from heaven the herbs spoke,

*Whom, alive, we reach,
that man does not perish (17).*

Among herbal plants, *soma* was considered to be the king. The two hymns which follow are related to this royal plant:

*Whatever herbs there are in Soma's kingdom,
the many, wise a hundred-wise.
Of these thou art the best
ready to desire, weal to the heart (18)*

*Whatever herbs ye be in Soma's kingdom,
Spreading earth-wide
impelled by the Lord of Magic Spells,
Lay your strength together in this herb (19).*

The *Soma* plant had multifarious uses during the Vedic period. The most important use was during sacrifices, when people used to extract its juice by crushing the stalk with a stone (*Rigveda* IX.107.6), or in a mortar and pestle (1.28.14). The color of the plant as well as of the juice was said to be brownish ghee (clarified butter) (1.92.1). The juice, the celestial drink, is also called *Amrita* (nectar).

The *Rigveda* also mentions that *soma* juice healed the sick, made the blind see, the lame to walk, bestowed language, and increased fertility (VII.68.2; X.25.11; I.91.6; VII.48.47; IX.80.4.49). It was said that this plant "dwells" in mountains. *Rigveda* even specifies the name of the mountain as Mujavat (1.28.1-4). Jaggi comments that the *soma* plant has not yet been recognized botanically, although different conjectures have been made by scholars. Most probably, it belongs to the Ephedra family, being possibly either *Ephedra pachyclade* or *Ephedra distachya* (127).

The *Atharvaveda* also provides hymns for chanting while preparing medicines from various plants, for example:

*The purchased, and praised, most powerful plants
May thou protect this village,
cow, horse, man, and beast (11).
Rich in sweets the root, rich in sweets the tip,
rich in sweets has grown the middle of these plants
rich in sweets the leaves, rich in sweets the flowers of these,
partaking of honey, a drink of the elixir of Immortality [amrita].*

*May they milk forth melted butter, food,
and first of all, milk (12).*

*The Asvattha [Ficus religiosa Indica tree], the Darba
[saccharum cylindricum grass], Soma, the King of plants,
the immortal dish, rice and remedial barley,
Ye twain immortal sons of Heaven (20)
Rise ye up; it thunders and roars at [you], O herbs,
When Parjanya [the god of rain] favors you with seed,
O ye children of the spotted cow [the earth] (21)
That plant the boar knows,
that remedial herb the mongoose knows,
(the genii of the Amrita -- containing moon cup
guardians of vegetative lunar cycle
those I call to his aid.*

The *Atharvaveda* details many plants by name as well as their role in curing particular diseases. Majumdar (160), based on the *Atharvaveda*, distinguished eight categories of medicinal plants -- those that cure different diseases of the body (*Kayachikista*), cure diseases of the mind (*bhutavidya*), help in the procreation and protection of children (*Kaumara-vidya*), are used against wounds (*Salyavidya*), are used as antidotes against snake bite, etc. (*Vishavidya*), are used for securing prosperity and prolongation of life (*rasayana*), are used for virility and erotic success (*Vajikarana*), and "miscellaneous".

Sushruta, the Vedic surgeon of that period, also classified and described the medicinal plants in detail, the regions in which they grew, and the soils best suited to their growth.

Vedic agriculture

The whole concept of life among Vedic people was to create harmony in nature through consciousness and live accordingly. Basham described *Rta* as "perhaps the highest flight of Rigvedic thought." Because of *Rta*, the world takes its regular course, day follows night, and season succeeds season. Man must live according to *Rta*. In later days, *Anrita*, ("non *rta*") became one of the commonest terms for untruth and sin. Agriculture was integrally a part of this total *Rta* system, and therefore cannot be studied

in isolation from it.

There are several texts dealing with agriculture, trees, and soil(35)(98)(135). Their clear message is that the relationship between Vedic people and nature was so close that people treated all life, including vegetation, as themselves -- as human beings. People were obliged and grateful to the animal and plant kingdom. Because Vedic people were guided by consciousness, they were sensitive to the "souls" of others. Agriculture in Vedic times was therefore seen in terms of managing natural resources to maintain harmony among people, living creatures, and vegetation.

In order to keep harmony with the universe and maintain co-existence in society, the primary concern of the Vedic people was not to antagonize or harm nature. Nature was the Mother Goddess who not only gave shelter to all creatures, including people, but provided their source of life. Therefore, in reciprocation, Vedic people tried to satisfy or keep in balance natural phenomena by worshipping them as gods and goddesses (200). Vedic knowledge was cosmic. It saw one-ness of human beings with nature, trees and plants, animals, space, the sun, the dawn, and elemental forces like earth, water, fire, wind, and thunder.

To illustrate the close relationship between the Vedic people's understanding of nature, their treatment of natural phenomena as gods and goddesses, and their inspirational view of agriculture, some examples may be given of Vedic gods and goddesses and how they embody attributes of natural phenomena.

During the Rigvedic period, *Indra* was understood as the greatest aspect of God, fulfilling the functions of both god of war and of weather. It was Indra who slayed the evil dragon *Vrtra*, and who held water in the clouds and thus brought rain to the parched land (21). This slayer of dragons and rider of storms was also associated with thunder. To this day in Nepal, Indra remains the rain god as some respondents mention in the interviews later.

Aryanyaani was a nature goddess, the goddess of the forest. Hymns devoted to her describe her as "the elusive spirit of the forest" (Rigveda 146) and urge people to be sensitive to the mood of nature.

Surya was the sun god, who drove across the sky in a flaming chariot in order to give warmth, light, and life to all fauna and flora of the Earth. *Pusam* was also a god associated with the sun who crossed the sky daily, but his main function was as guardian of roads, herdsmen, and stray cattle.

Rudra was guardian of healing herbs. *Vaayu* was the wind god. *Agni* was the fire god, and because *yagya* was the main ritual performed by Vedic people, *Agni*, in particular, was the god worshipped by priests who dealt with him constantly at the sacrificial fire. He was also the deity of the home, as he dwelt in the domestic hearth; and he was the intermediary between gods and men, for he consumed the sacrifice and carried it to other gods (21).

To keep natural phenomena and humanity in harmony, roles were also played by *Usha* (dawn) and *Raatri* (the spirit of the night). *Gandharvas*, divine musicians, and *Apsaraas*, divine female dancers, also contributed to maintaining the universe in harmony. Finally, *Varuna* was the guardian of *Rta*, the cosmic order.

Kaviraj Narapati Pokhrel ¹⁹ explained that Vedic agriculture encompassed the planting, cultivation, or gathering of types of plants for three reasons: dietary value, medicinal value, and other general value which ranged from self-sown pasture grasses to tree species valued for firewood, construction, or religious purposes.

In the same work, Kaviraj Pokhrel painted a scenario of a Vedic village environment. According to this scenario, the Vedic family system was one of large, extended families who lived physically close together, their group of houses forming a village. Closest to each house were planted medicinal herbs. Immediately beyond the herbs would be vegetables without vines, and beyond these low-growing vegetables would be cereal crops mixed with vine-growing vegetables, with underground tuber-producing vegetables planted around field borders. The small fields were separated by layered rows

¹⁹ Kaviraj Pokhrel was the writer's father-in-law. He earned a PhD in Veda and Ayurveda from Banares Hindu University, India, and was one of the first four Ayurvedic physicians educated to that level in Nepal. The material cited here is from his unpublished collection of works. Before his death, he published six books in his field.

of trees -- small, medium, and large -- creating a terraced effect. The trees were carefully selected, some with medicinal properties, some having religious significance, many varieties of fruits, and some used for fodder for animals which formed an integral part of the total farming system.

Although livestock were housed in small sheds between the houses and nearest fields, and were stall-fed, every household had a small plot of pasture land where cows could graze on their way to and from common grazing lands. In those small, private pastures, the households grew smaller non-poisonous shrubs used for the cows' bedding.

Sushruta's *Samhita* mentions that the best soils were used for medicinal herbs as well as for various kinds of trees, and continues by describing ideal planting and growing conditions to establish. For example, the soil surface should be even, and not interspersed with gullies or stones. It should not have been previously the site of a cremation ground, or a holy temple. The soil should be glossy, firm, steady, black, yellowish or red, and should not contain excessive sand, potash, or other alkaline substances. It should be favorable for the germination of seeds and easily pervious to the roots, and have necessary moisture from a nearby source of water (126).

The commonly used manure was cowdung. In relation to the treatment of trees, the *Brhat Samhita* (55) states that a soft soil is helpful for all varieties of tree, and that the first activity before tree planting ought to be to sow *sesamum* at the site, "which must be crushed when in bloom" to mix with the soil. "This is the first treatment to be done for the soil". The translator, Bhatt (35) comments that when cut into pieces and allowed to mingle with the soil, sesamum plants in bloom would produce an excellent green manure for preparing the soil for further cultivation. It was also held that if the sesamum crop did not flourish in a field, nothing could be grown there with advantage. In special cases, Vedic people used to treat their plants, as they treated themselves, with ghee, honey, milk, and other pure foods. They also used neem as a pesticide. To prevent other influences which might destroy their crops, farmers made use of charms both at the time of seed sowing and harvesting (126).

The other important element in Vedic farming were the rituals performed while

preparing the soil, and while undertaking all other tasks such as planting, harvesting, preparing the medicinal alkalis, and tasting the new crop. Some examples of these rituals may be given briefly.

To avert drought or excessive rains, the *Atharvaveda* details a number of techniques. One of Lord Vishnu's²⁰ ten incantations, *Matsya* (literally, "fish"), was considered powerful for saving people from floods provided they also followed other principles of maintaining "harmony" with nature.

After selecting new land for a certain purpose, farmers performed a ritual known as *Langalajojana* (3). This was a ritual necessary before bringing land into cultivation for the first time. Because such land was regarded as pure, it involved finding the best bull which had also never before been used to plow. Before using the bull for plowing, the bull had to be worshipped and fed the finest ghee and honey²¹.

Sushruta describes rituals for preparing medicinal alkalis of various strengths from vegetable products to apply externally on the skin to treat various diseases. A physician wishing to prepare such an alkali should first purify his body and mind and observe a fast on an appropriate day in autumn, marked by a combination of auspicious stars. After having climbed to the top of a hill, he should select a full-grown *Ashita Mushka* tree of medium age, growing on a specifically recommended soil, and not adversely harmed in any respect. Having formally invoked the spirit of the tree, the physician should feel it on the following day, reciting alongside the tree a hymn which reads: "O thou possessed of mighty virtues; O thou, endowed with fierce potency, may thy potency never decrease or vanish. Stay here, O thou blissful one, execute my work and after the performance thereof, thou shalt be at liberty to ascend to the heavenly region." Then, having

²⁰ *Vishnu* is believed by Hindus to be the protecting aspect of divine force in the trinity of *Bramha*, *Vishnu* and *Maheshwor (Shiva)*, *Bramha* being the Creator, and *Shiva* the destroyer and renewer of creation.

²¹ The writer's wife informs him, from her years of experience of helping her father prepare Ayurvedic medicines, that ghee and honey are the two most essential ingredients used in preparing the base of most Ayurvedic medicines.

performed a ceremony involving the use of a thousand white and red flowers, the physician should cut the tree into small pieces and keep them in a place protected from the wind. After this, the process of preparation of the alkali began, in which this wood was one of the major constituents (126).

Similarly, during the Vedic period, people would not just start eating a new crop without following a certain ritual. The texts describe various rituals, *Navapashana*, for tasting different new crops. *Manusmriti* (4.27) suggests eating new uncooked rice or barley only after offering some first to God through a *yagya* ritual. In Nepal, this is a ritual which has been continuously practiced up to the present time. In the home of the author's in-laws, the first of the new rice is de-husked in a *dhiki*, mixed with ghee, black sesame, and unhusked barley to make *charu*, and then offered to *Agni*, the fire god. *Mantras* are chanted throughout the *yagya*. In the fire, the *charu* burns slowly creating gentle white smoke with a sweet, pleasant scent which purifies the home and slowly escapes outside through the window of the *yagya* room to take the message to the heavens. Later, the remaining new rice is made into *khir* (spicy rice milk pudding) to be tasted by the family members.

Vedic people followed a mixed pastoral and agricultural economy. The Rigvedic people were primarily pastoralists, and cows and bullocks were their most valued possessions. Jaggi (127) cites one of the Rigvedic hymns describing a cow returning from pasture in the evening and licking her calf as one of the most pleasing sights, and the lowing of the milch cows as the most musical sound to the Rigvedic Aryans.

Cows were donated as a reward to people who were conscious, without sin, and truthful. The *Agni Puran* (211.1) states that the number donated was according to the capacity of the individual. Thus, cattle played a predominant part in their agricultural-pastoral life. Horses, sheep, and goats were also mentioned. Basham (21) explains that cattle were valued as a kind of currency, with warriors expecting cattle as booty, priests being rewarded for their services with cattle, and farmers praying for increase of cattle.

In the earliest period, grain called *yava* is mentioned, which translators have interpreted as barley. Pokhrel (200), disputing the findings of most Western and some

Indian and Nepali scholars, analyzes various Vedic texts²² to show that rice, as well as other grains including wheat, are also mentioned. Jaggi is also of this opinion (126). According to Pokhrel's research, the *Atharvaveda* (11.3.5-6) mentions not only paddy and rice, but also the different specific products of rice dehusking and winnowing. It is clear from these authors that grain, as well as milk and its products formed a substantial part of daily diet, and that vegetables and fruits were also consumed in large quantities. Meat was eaten only in connection with certain ceremonial sacrifices (127).

While eating food, there were specific techniques that Vedic people used to follow to maintain purity of mind and body, and so that food would do no harm. Vedic people would follow a daily *dharma* (proper ritual) of taking bath, observing cleanliness of toilet, chanting mantras, washing hands and feet, wearing a pure, clean cloth, sitting on a pure, clean cushion, and offering *prasaad* first to God. Then only would they eat their meal. These rituals of cleanliness are still observed today in Nepal and India by most Brahmin, Kshatriya, and Vaishya households who have kept the pure Vedic tradition. And wherever they travel throughout the world they take this tradition with them (201).

Respondents' views on indigenous (Vedic) knowledge in Nepal's agricultural development

The respondents for this research included a cross-section of people in Nepali society who were expected to hold relevant opinions on the value of the Vedic tradition to contemporary agriculture. The learned scholars of the Vedas, who interpret Vedic traditions as prescribed in Vedic texts, are Vedic pandits. Brahmin priests are those who perform the Vedic rituals for their clients. Then, because a relationship was anticipated between agricultural practice and astrology and Ayurveda, experts in these fields were also sought and interviewed. Finally, farmers from various ethnic groups, and agricultural professionals, were included in order to find out the extent to which Vedic consciousness prevails today among agricultural practitioners and the extent to which farming practice is still influenced by Vedic theory.

²² For example, Rigveda 8.77.6; Atharvaveda 11.3.5-6; and Yajurveda 13.12.

As discussed in chapter 4, due to the state of emergency in the country, both political and due to natural disaster, it was not possible within the time-frame of this study to obtain responses from policy-makers identified in this research (the Prime Minister, the Nepali Congress Party President, the Minister for Agriculture, and the Planning Commission Vice-Chairman).

The remainder of this chapter covers the responses of the different categories of respondents to the interview questions, in the following order: Vedic pandits, priests, Ayurvedic physicians, astrologers, farmers, and agricultural professionals.

Vedic pandits

On the basis of their responses, Vedic pandits can be classified as "liberal" and "conservative". Of the eight pandits involved, only one was found to be conservative on the basis of his advocating the revival of Vedic tradition exactly as stated in the texts. In contrast, "liberal" pandits are of the opinion that, although Nepal is a Hindu state, because of its ethnic diversity and changes in environment and technology with time, the *basis*, or foundation, of Nepal's overall development must be the Vedic tradition but adopted in such a way that reflects the changed context -- i.e., so as to be acceptable to most Nepalis and also, to some extent, the international community. Despite this difference in application, the textual interpretation of both the conservative and liberal pandits was almost the same.

However, their interpretation of *Varnaashram Dharma* was different. "Liberals" advocate that because *Varnaashram Dharma* has become socio-politically established as the caste system²³, if advocated now, it would antagonize other ethnic groups and lower

²³ Caste-based society as practiced now started to develop from around A.D. 1000 out of a movement to maintain purity in society in response to Muslim invasions which directly attacked the Vedic social system, raping and forcefully marrying Hindu girls. In reaction, thousands of Hindu women committed mass suicide to save their chastity by burning themselves on pyres, and caste became more rigid from fear of matrimonial relations with Muslims which would have produced non-Aryan offspring. Since the thirteenth century, much of the northern Indian subcontinent came under direct Muslim rule, and Hindu society became even more conservative.

castes. The concept of Vedic tradition must therefore be explained in a way that suits contemporary Nepali society, the majority of which is liberal. This "liberal" interpretation is understood by these pandits to reflect the true intention of the sages who originally composed the texts.

In contrast, the conservative view is that unless *Brahmins* are strictly demarcated from *Shudras*, and, even more to the point, from "beef-eating, polluted *Mlechha*" (white men), Nepalis cannot meaningfully start on any development process. The first consideration is purity.

Besides this disagreement over fundamentals, in other respects pandit interpretations of the Vedic tradition are similar. Their responses to the interview questions are presented in the following pages. The questions they were asked can be found in Appendix III. As their responses were received more in the form of long essays which did not correspond to particular questions from the schedule, and as their "essays" expressed the "flow" of their ideas in a natural way, their responses are organized and merged in that manner here also. They state:

"Different people define "development" in different ways. Based on Vedic experience, we define "development" as a nation's all round effort (from governance to preservation and management of natural resources) to build consciousness: consciousness of the whole society -- rulers and the ruled -- and consciousness of mind, intellect, and physique which is directly harnessed to maintain harmony with nature. *Sankya Shastra* and *Yogsutra* have defined development as a "result" of something constantly happening or keeping on changing without stopping for a moment. The word "development" denotes "intellectual" development first. A rolling stone changes its shape after a long time, and animals also develop physically. But the real concept of development is the relationship between the unbounded developmental aspect of humans and the universe. *Yajurveda Satpath Brahmana*, first chapter, explains that because humans take birth in this world with four kinds of debts (*Rn*) they have to start repaying those debts as soon as they are born. First of all, since a young age, during one's studentship, one pays the debts of the

rishis from whom, directly or indirectly, one receives knowledge. In addition, every day the best-suited *mantra* should be chanted keeping in mind its full meaning, and meditation be performed. Secondly, by getting married and having children, one pays parental debts. Thirdly, through devotion to the Gods, one pays the debts of the Gods. And, finally, by the act of reforming the economic, educational, intellectual, agricultural, and material conditions of the nation in which one lives in order to benefit others, one pays off all human debts.

"For such material development, chapter II of the same text explains that spending should not be for the development and protection of only human beings, but that it should be combined with the preservation and protection of all creatures on earth.

"Even though the people of the world look the same, only some of them can invent new intellectual ideas to form the basis of other developments. Sometimes, selfish rulers, if not satisfied, do not allow new inventions to be released publicly, which means that the development process is stopped. Such examples are found all over the world wherever cruel rulers are in power. When the French scientist, Bruno, stated that the earth revolved around the sun, the King ordered him burnt alive at the stake, and he was executed immediately. In Nepal also, during Chandra Shumsher Rana's autocratic rule, any kind of development was not allowed, and especially scientists were put in trouble. But in a democracy, people are encouraged to pursue development which stimulates the intellect also. That is what we are hoping for in Nepal since we were given democracy two years ago. The Vedic concept of development is very wide.

"It is a false notion to say that only Western science can solve human problems. Everywhere in the world there are processes of progress and downfall. In the past, as mentioned by *Sarvapalli* Radhakrishnan (), in Britain they used to cover their bodies with animal skins and throw live people into fire in order to please their God. In contrast, during the Vedic, *Ramaayana*, and *Mahaabhaarat* periods, and even until the period of

Bikramaditya²⁴, with very few exceptions, there prevailed a humanistic approach in society. Only since the Muslims invaded India and ruled the subcontinent for five to six hundred years did everything collapse in our part of the world, and, in the home of religion, many anti-religious systems were enforced. However, there were, and still are, many things that people can learn from the Vedic tradition. Later, towards the middle of the twentieth century, the *sati* system was illegalized in Nepal and India, and only towards the end of this century, child marriage and untouchability were made illegal. The source and inspiration of such reforms were the Vedas. During the time of Rana rule in Nepal (1846-1950 A.D.), if anyone crossed the seas and visited the West, he would be outcast. In Vedic times, that would never have happened, and caste was not primarily associated with birth.

"If we compare Vedic knowledge and modern science, then the meaning of "knowledge" differs fundamentally. The meaning of knowledge alone is simply to know something, and everybody, to a greater or lesser degree, possesses such self-contained knowledge. The meaning of the word "science" in Sanskrit is "*specific knowledge*"²⁵. Even in the *Bhagavad Gita*, Arjuna explained about both Eastern knowledge and Western science, showing that he distinguished between them. Amarkosh refers to science as a *Silpasastra* (artisanry), and much material development and textual knowledge has been defined as science. In a nutshell, to plant a mango seed and nurture the seedling so that it bears fruit is knowledge. To create a hybrid is science. The meaning of Vedic knowledge is about *Parameshor Parabrahma*²⁶ and good conduct, whereas the meaning of modern science covers things like building an aeroplane or preparing atom bombs.

"Our society, while following Vedic traditions, used to be devolved in all

²⁴ Bikramaditya ruled parts of the Indian subcontinent 57 years B.C.. It was he who initiated the Bikram Sambat calendar which is still observed in Nepal and India today. The calendar year begins with the month of Baisakh (equivalent to April 14th).

²⁵ "*Bishes*" in both Sanskrit and Nepali.

²⁶ Literally "understanding of *Brahmana*" in order to reach oneness with *atman*.

respects. People used to follow all the traditions such as meditation and devotional yoga even without knowing what exactly the Vedas said. After British rule started in India, the colonizers started separating people from one another by converting some Hindus into Christianity. To create confusion about the Vedic tradition, some so-called Sanskrit scholars, like Max Muller and Keith, started translating the Vedas in a very distorted manner, and even prepared textbooks based on their misrepresentations of the facts. As a result many young people were influenced against the Vedic tradition. Even after British rule was put to an end, these brain-washed young people were left behind. The school text books written by such brain-washed writers which describe the Vedic and Aryan civilization of India and Nepal (grade 6 in India and 9/10 in Nepal) have thrown those atoms bombs created by science on the brains of our students. Because the legacy of Western influence is so negative, the Vedas which we place in our heads, these neo-Western students might throw in the garbage.

"In Vedic philosophy, there is no trace of the fatalism that Westerners have accused us of. Fatalism is only a medium for expressing personal anxiety, to seek relief in a time of extreme trouble. Although the Vedas themselves do not mention the concept of "fate", there are other texts which state that "fate" is not dependable, so that without depending on it, one has to keep on making new progress in life. The *Bhagavad Gita* (13.4) explains it in this way: There are five factors necessary for accomplishing any kind of work: the place where the work has to be done, the strength or power of the person involved, materials for accomplishing the task, other people's cooperation, and divine support.

"Some people define "divine" as fatalistic; but in a real sense, divine indicates earthquake, too much rain, plague, or drought, i.e., various kinds of natural disasters which destroy the harvest. In the *Mahaabhaarata* and other texts it is clearly written that: "to be a fatalist is a foolish action." Instead of being industrious, if someone becomes a fatalist, he is a fool. Only an impotent person relies on his fate. The Vedas suggest that Eastern just as much as Western people should be ever active, and go on and on in a never-ending development process. As it is written: "O! human beings! Make the whole

world the best place for all and make the ordinary people also full with divine qualities" (*Rigveda* 9.63.5; 10.53.6)²⁷. This is because the Vedic tradition is not against richness and material prosperity, it is simply against acquiring material goods through *adharmic* means (*Rigveda* 8.61.11). Even many rishis were rich.

"Many Westerners also believe now that there is a good meeting point between Vedic and Western knowledge. That is why some Westerners have started studying and learning about our knowledge, either by coming to our society and living within our culture, or by practicing our knowledge in their countries. From our part of the world, Maharishi Mahesh Yogi and some other *yogis* are trying to introduce to the West the Vedic ideas of consciousness, good conduct, and *yogpath*²⁸, and the Vedic philosophy of cosmic family. Slowly, the message will enter the minds of these knowledge seekers and they will be able to judge the difference. The relation between Vedic knowledge and modern science is like this: If an atom bomb is in the hands of a cruel king, he could use the bomb for bad purpose; but all the time the power of that bomb could be used for good purpose. The atom bomb represents modern science, and the use for good purpose represents Vedic knowledge.

"Regarding the enemies of the Vedic tradition, the first enemies were the *adharmic* Muslims and later the Christian rulers who, over hundreds of years, put all their effort to destroy Vedic texts and the tradition that prevailed across our continent. They knew the value of the Vedas, but were jealous and purposeful in destroying it. Nowadays, brain-washed Western-educated people who forget their tradition are the main enemies of Vedic culture, and now they are more dangerous than ever because they are the ones designing the national curriculum in both their own and our countries. In Nepal, since the New Education System Plan (1971-75) was introduced, all Sanskrit schools of the whole Kingdom were closed down. After a long struggle by devotees of the Vedic

²⁷ The pandits reiterated that these slokas relate to mental and physical development of the person, as well as material development.

²⁸ *Yogpath* is the way directed by *yoga* or the practice of *yoga*.

tradition, the government permitted the opening of one Sanskrit university under whose management some other campuses have been revived²⁹. However, because all the school-level studies [of Sanskrit] are omitted, the creation of this university is like building a house without a foundation. Because the Vedas are in Sanskrit, until there are Sanskrit schools once more, or until Sanskrit is again taught in other regular schools, the university will be almost empty."

The conservative pandit, in particular, had the following to say about enemies of the Vedic tradition:

"There are certain Brahmins who follow a few practices for the sake only of showing up those who are not spiritual in mind. They practice the Vedic tradition for their own benefit. Seeing their example, ordinary people lose faith in it.

"The so-called spiritual King's gurus and priests only explain about fasting, donating, and visiting holy places without any understanding of the Vedic tradition. This has caused the downfall of our tradition.

"Those born in the Vedic tradition but who are not following it now are those who became greedy for the materialist world, and they are the most dangerous influence against it.

"Brahmins and also other castes who are not being raised according to their tradition have developed a slave mentality. These are also a very dangerous element.

"Brahmins who are taken by foreigners to their countries for the pretension of education become influenced by Western materialism and turned into agents of their customs.

"Because the administrative and social environment in the Indian subcontinent is anti-Vedic tradition, even followers of this tradition are not able to teach their own children properly."

²⁹ Pandit Chhabilal Pokhrel (one of this study's respondents) was one of those leading this effort. The Sanskrit University is located in Daang, in midwestern Nepal. Pokhrel was the main guest of honor at its inauguration, and the pandit with knowledge of the exact Vedic rituals appropriate for such an occasion.

About Vedic agriculture, the pandits say³⁰:

"Agriculture was the main expression of people's understanding of living on earth, and the way of life. Because agriculture was so important in the Vedic way of life, even the royal family used to celebrate one day each year by planting rice themselves in a small area.

"The *Rigveda* (10.14) tells us that one gambler once lost everything in gambling. Not even his in-laws helped him after his loss. But one pandit advised him, "instead of gambling, go and farm, and you will be prosperous." After that, the man did engage in agriculture, and became prosperous.

"There are several *mantras* dedicated to the prosperity of agriculture. The farmers' mental state was always encouraged. Farming was the practice of all the *varnas*. There were, and still are, traditions of performing rituals after each new harvest.

"Corn and potatoes are not mentioned in the Vedas because they came to India and Nepal only in the seventeenth century along with tobacco. *Rigveda* (58.4) mentions about the use of the plow, and *Yajurveda* (12.5) explains that furrows were made by the plowshare. Everybody who lived a family life could use the plow. In Nepal, until very recently the social notion (a misconception) was that if a Brahmin plowed he would lose his caste, and many instances occurred of Brahmins being outcasted for plowing their land. But during the Vedic period there was no restriction of that kind on any *varna*.

"During the Vedic time, the technique of farming was exactly the same as it is today in places where Western technology has not been introduced. The only difference was that techniques were entirely based upon local means and materials, whereas today these have been slightly changed. For example, in those days the only local technology available for husking and grinding grains were the *dhiki* and *jaato*³¹. These days, in the town areas, those indigenous technologies have been replaced by rice mills and flour

³⁰ The textual references that the pandits cite are mostly the same as the texts mentioned in the previous part of the chapter; therefore, textual citations are avoided in most cases.

³¹ *Dhiki* is a long, heavy, pivoted beam used for de-husking grain by pounding. *Jaato* is a manual grinding-stone.

mills. But in rural areas nothing has changed.

"The combination of seasonal and *sattvik* food was associated with the farming system, and even today some families still follow this principle. Good health is the result of good food and herbal use. Almost all kinds of medicinal herbs are available in Nepal from the high Himalaya to the *tarai* [plains], and in each locality they have been very valuable for people who use them. But there has been no effort by the government to recognize these herbs and preserve them. Now, there is no question of farmers cultivating them because they are influenced by the Western values imported by foreign aid projects. The Western countries ignore this knowledge of ours on purpose because they are afraid that they will lose control over us if something from our country becomes important.

"In name only, however, we have a national level governmental institute, the *Singhadarbar Vaidhyakhana*, which is supposed to produce all the Ayurvedic medicines for the whole country, and should be the institution to preserve and protect our indigenous medicinal herbs. But this institute is degenerating. It receives little serious encouragement from government, and its staff are ten a.m. to five p.m. bureaucrats who take no initiatives of their own. At least in India, Ayurveda is being revived into a position of importance in national policy. That should influence Nepal also, hopefully.

"To alleviate poverty, rich people have to give to the poor (*Rigveda* 10.117) as long as the poor can be prosperous by doing something [³²]. The rulers and the rich must stop economic corruption so that the poor also are given the chance of equally benefitting by acquiring property. For too long the ruling classes in this country have taken all the property to foreign countries' banks for their security. That is how most Nepalis became poorer and the national economy collapsed. This practice is absolutely anti-Vedic. The King did not keep to his Vedic dharma and created a tendency for all in power to lose sight of their dharma. That is why he almost lost his position³³. Some

³² The concept of paying off people's debts, explained earlier, is being applied here in the broader sense of the rich giving donations to humanistic organizations directly involved in helping the needy.

³³ A reference to the 1990 revolution.

texts suggest that if a King is *adharmic*, people should not only de-throne him, but he should be killed if he is sinful. Unless spiritual values are restored we cannot accomplish any kind of development in our country.

"About population pressure and family planning, there are a few references in the Vedic texts, especially in the later periods³⁴, which mention how, just as pigs have too many children, so they are sold and consumed by certain people, and dogs have many children, but few of them survive, so it is clear that human population if they do not take care of themselves would also have the same fate. However, with the help of astrology and Ayurveda people could predict the actual ovulation day and avoid intercourse. In the main, there were personal and social ethics regulating sexuality. There are also references relating to how parents may produce intelligent children by using certain herbs, and how to control births herbally without any harmful effects.

"The Vedic concept of development is very broad. It has room for other technologies to be adapted according to the time, the environment, and the need. However, only useful Western technologies should enter Nepal -- which will not supersede our indigenous *Sanaatana Dharma*. To guard against that we have to be strong. During the recent period of development³⁵, all kinds of harmful influences entered Nepal along with Western technology. The worst influences were published materials which changed Nepalis' minds. Equally bad, were those foreign workers who were themselves completely lost people who spent their time partying and drinking. What good can a drunkard do? In Nepal this conduct was tolerated only by *Matwali* (drinking) castes. Now the caste system has become liberal, but because of Western influence even the *Brahmin* and *Kshatriya* have learned to drink alcohol. This is a fundamental problem facing Nepal because it is their [*Brahmin* and *Kshatriya*] *dharma* to think and rule wisely.

³⁴ No doubt in the earliest period there was no population pressure. But the sages had vision of everything, including the concept that there could be too many people giving pressure to Mother Earth.

³⁵ This appears to be a reference mainly to the period of Panchayat government, 1960 to 1990.

"Anyone who brings good things anywhere in the world should be accepted by all, but if what they bring is bad and harmful to the local tradition, do not accept it. Even if you yourself bring something which contradicts your tradition, you must quit realizing its badness.

"On the basis of Vedic traditions, we can teach the world about the best continued action of human beings with the realization of one-ness of all human beings who possess good conduct, activeness, wisdom, and education, along with devotion to the omnipresence of God."

Finally, about the four different periods known in Hindu society as *satya*, *treta*, *dwaper*, and *kali yug* ³⁶, some pandits maintain these are astrologically determined eras. In the Vedas, *yug* (era) indicates past, present, and future periods. The fearful prospect of an impending *Kaliyuga* is described in the *Puranas* and all *Smritis* except *Manusmriti*. These texts explain that because of the influence of *Kaliyug*, an anti-Vedic tradition would influence the world, after which it was believed that the *Kalki* incarnation of God would destroy the evil-doers who destroyed the Vedas and *Satyayug* would return.

Pandit Pokhrel's interpretation is not so apocalyptic. He responded:

"I and my colleagues also used to believe word for word what was in the *Puranas*, and used to think that there was no other way of achieving progress except to wait for that day. But that was very worrisome until I was able to study deeply the explanation of the Vedas, *Manusmriti*, and *Mahaabhaarata* which explain that *satyayug* can be restored in any age. Only since then has my delusion about *satya-kali* been removed and peace of mind has been restored. Now I tell people that we do not have to wait for God's *kalki* incarnation to bring *satyayug*. According to *Manusmriti* (9.301), *Satya*, *Treta*, *Dwaper* and *Kaliyug* occur according to the type of government a country has. If the government carries out all good reforms, runs the administration properly, and everybody in the land is prosperous and happy, that is *satyayug*. But if the government is the opposite of that

³⁶ *Satya* is the era of truth, and *kali* is the era of untruth. The other two eras lie in between these two opposites.

and anarchy rules, and the economic condition is very bad, then *kaliyug* reigns. The frightening description of *Kaliyug* of the later *Puranas* could have indicated the 12th and 13th-century's blind-faith Muslims and Goa's 15th century Christian invaders. During Rana rule in Nepal, if an untouchable entered the weekly bazaar [outdoor market] of edible foodstuffs, the police used to expel him by beating him from the place. This, I explain, was *kaliyug* for that untouchable. In 1949, a Brahmin was outcast because his father had gone overseas to the land where people drink alcohol and eat beef. But we³⁷ advocated for him and brought him back to touchability. Muslim rule was the period of peak *Kaliyug* for Hindus.

"*Manusmriti* (9.102) also explains the influence of *Kali-Satya* as a concept applicable not only to the rulers and ruled at a collective level, but also on the individual level. "When a person is foolish, idle, not industrious or a drunkard (whose effect looks like sleeping), then it is *Kali*; when the person wakes up from these influences, then that is *Dwapar*; when he starts engaging himself in various works, then it is *Treta*; and when he actually puts all his energy into his work and participates in full-fledged development, then that is *Satya*."

"There have been efforts at various times to bring back into practice the old traditional values in India and Nepal. The first step should be for the King to become just and benevolent, upholding his *dharma*; after this the economy prospers, people become happy, and golden rule can prevail. In our view, for Nepal to have all-round development, the best elements in the old traditions must be revived, and we should accept only aspects of the Western system which can co-exist with our tradition. Otherwise, there is no way in which we can maintain balanced development".

³⁷ Pt. Pokhrel was himself arrested by the Ranas for admitting two untouchable brothers to his Sanskrit college where he was the principal. Conservatives in society also proposed that he be outcast after he carried on his shoulders the dead body of an untouchable man to the place of cremation.

Priests

In Sanskrit as well as Nepali, the priest is called the *purohita*, which means "full benefit", implying that he is defined as a person who brings benefit by his good deeds to the people in this life and the next. To become a *purohita* involves studying a specific Vedic text, the *karmakaanda*, understanding its deepest meaning so that they can explain it to their *yajamaan*, or clients. *Karmakaanda* is a text full of Vedic *mantras* from various *Samhitas* which relate directly to the day-to-day life of the people, governing the social, religious, and spiritual rituals performed by ordinary people -- i.e., by householders living in society, as distinct from people who have chosen the hermit's life in a forest.

Many Nepali families have a family *purohita* who visits their house early every morning to perform rituals in the family *puja kotha* (worship room). Alternatively, a family member rises in the pre-dawn for worship in order to start the day with good influence for the whole family. The most ordinary daily ritual of a devoted Nepali Hindu begins with the chanting of dawn *mantras* devoted to various deities such as the sun, the dawn, and even parents and guru. Then, with the first step onto the ground, the earth, a mantra is chanted that seeks the Mother Earth's forgiveness and that worships her for providing for all human needs. Other rituals follow, such as washing with holy water -- water that has been purified through the chanting of a special mantra -- and the performance of *puja*, a more elaborate worship ceremony honoring any of the innumerable deities recognized in the Hindu religion as embodiments of specific attributes of *Brahman*. The morning program ends with meditation and prayer. Only after these rituals does a Nepali taste food.

Rituals during the day depends on a person's profession. A scholar may visit a temple of Saraswati, the goddess of learning, and go on to study filled with that influence. A farmer performs rituals appropriate to the day's task: sowing, weeding, watering, harvesting, etc. In the evening, other rituals are performed to prepare for sleep.

Every Nepali does not perform a full program of rituals during each phase of every day. But most Nepalis carry out at least a few of the daily rites, and it is rare for

any Nepali not to perform the rituals as prescribed in Veda on special occasions predetermined by astrological calculation. However, pure Brahmin and some Kshatriya householders do constantly and continually follow Vedic rituals during each phase of every day.

As noted earlier, the responses to the interview questions were contributed by seven Brahmin priests. These responses now follow.

"*Karmakaanda* has a great role in agriculture as it gives suggestions for people to follow in sequence. The foundation of farming is cattle, therefore they (most especially the cow) should be worshipped as Lakshmi³⁸ the Goddess of Wealth because we drink milk and eat curds, *mohi*³⁹, ghee, and other products from her. *Karmakaanda* suggests that these foods are the best for people's health. To emphasize the importance of cows, *Karmakaanda* makes a number of suggestions.

Family people should welcome guests by offering sweets made out of milk products.

Cows should be donated to any Brahmin who loves and protects them.

Uncastrated bulls should be left alone unchained and untamed for breeding purposes and as a donation to Lord Shiva, the protector of cattle.

Castrated sons of cows should be used for plowing.

Land should be made fertile for planting crops by applying the manure of cattle, both dung and urine, and of both male and female.

"The *Karmakaanda* also suggests that any surplus harvest over household needs should be given to the poor, and that some grain should be donated for *yagya* sacrifices performed by a Brahmin. The purpose of such *yagyas* is to bring rain during the right season for the farmers⁴⁰, so that grain grows properly and produces in abundance. If

³⁸ The worshipping of Lakshmi to influence the prosperity of agriculture is described briefly below.

³⁹ *Mohi* is the left-over liquid after churning butter made from milk curds mixed with a double quantity of water. In Nepal butter is not made directly out of milk as in the West.

⁴⁰ The ritual is described below.

karmas [rituals, or actions] are performed by the right person who is really knowledgeable in Veda, the results will materialize very quickly.

"*Yajamaans* [client farmers] should: plant trees and shrubs on barren lands, protect the forest, and not destroy the pastures. The *sobha* ("worth") of a family's house is the *goth* (where cattle are housed), the *sobha* of the *goth* is the jungle and pasture. Therefore, everyone's duty is to protect and preserve the jungle and pasture.

"At the end of any kind of *yagya* or any other ritual, while the priest offers blessings, the following Vedic mantras are chanted:

"Let peace occur all over in the sky, on earth, in water, in medicine, in vegetables, in tree plants, in Brahma, and in all the varnas and all over the world; therefore everybody has to wish for peace."

"If the *yajamaans* are frustrated by not having good crops or are unwell for any other reason, they should consult an astrologer to read their birth time and find out what is wrong based on that particular time. Then a priest should arrange the right type of *yagya* to remove, or avoid, those influences which are causing the frustration and bad health. If the astrologer is experienced there is no doubt that the cause can be identified.

"God is omnipresent. As God is everywhere, if His guidance is followed without any selfish motive, nothing will go wrong for anybody.

"*Karmakaanda* also suggests that farmers give a break to plowing oxen at the times of the full and dark moon, during other important religious festivals, and on each anniversary of someone's death in the family.

"The lowest level among birds is supposed to be the crow, and among animals, the dog, because they are *sarvabhakshi* and eat anything. Even these lowest animals have their days in the *karmakaanda*, and are worshipped once a year on their special days. The *karmakaanda* gives due respect to everything in this universe and at the same time it provides justice to everybody.

"*Karmakaanda*, which is based on *Dharmasastra*, states that there is presence of God everywhere -- in humans, animals, and birds, and in unmovables like trees, plants, the jungle, and mountains. But these days, people have made laws such that only human beings are benefitted, and not the other beings. Therefore, the other beings are being

murdered without thought, for example, the slaying of the forests. No law seems to regulate this. Such *adharmic* occurrences are occurring in Nepal because of the influence of Western education which encourages the forgetting of *karmakaanda*. In the process, the profession of priesthood has been made to appear a minimal job and people look upon priests in a distrustful way. Because of this disruption, the real priests have started changing their profession and undertaking other professions such as agriculture or teaching. As a result, priests with little knowledge are appearing in Nepali society because there are still people who try to follow the traditions. But, guided by those with little knowledge, the purity of the knowledge is not being followed, and there are many contradictions and much misconduct is increasing in our society.

"The neo-priests are not able even to keep up their own good conduct as prescribed by the Vedas, and therefore they are unable to convey the proper messages that are contained in the *karmakaanda* to their *yajamaan* and the society at large. At the social level, the messages are not to engage in corruption, misconduct, extra-marital relations, harming or hurting others, disrespecting the elderly, stealing, lying, eating bad food, and neglecting the chanting of *mantras* and meditation. Because people are following such traditions steadily less and less, our society has become very insecure and dangerous. However, even now, if those people responsible for running the country would restore their own consciousness and try to restore old traditions, life for everybody would be better. That is still possible, because our society has not gone too far away from spirituality like in the West. Some Vedic pandits are advocating for retaining certain values so that society would not fall apart. If this is not done, then skeptics will make our country fall apart.

"In each and every step of a Nepali farmer's life there are rituals to be performed, from the ritual for preparing land for sowing to the ritual for storing the harvest. For example, for corn there is a pre-harvest ritual which is performed to rid the cobs of any kind of pest, and for rice there are rituals while puddling, planting, and husking. There are also rituals that should be observed when first tasting the new crops, fruits, or vegetables.

"Special kinds of trees, for example the *pipal*, *bar* and *bel*, and bushes, such as the *tulsi*, are worshipped because of their spiritual, religious, and life-giving qualities. For these trees and plants there are special rituals to observe when planting, weeding, watering, picking, and disposal after their use. In the Newar community, girls are married first with a *Bel*⁴¹ fruit, and then only later with a man. For this reason, as long as the *bel* fruit does not break or crack, even if her human husband dies, she can remain unwidowed.

"The relationship between human beings and vegetation and the land has always been so strong in Nepal that separating them apart causes deep disaster in society and in nature."

Below follow three examples of agricultural rituals practiced in Nepal that were cited by the priests.

MahaaLakshmi is the Goddess of Wealth and Harvest, and also the consort of Lord Vishnu, who is believed by Hindus to represent the Preserver or Protector. For Nepali farmers, rice and other grains represent wealth which is seen as the gift of *MahaaLakshmi* whom they identify with the Mother Earth goddesses, *Bashundhara* and *Annappurna*, bestowers and protectors of agricultural produce. With the storing of the autumn harvest, Nepalis rejoice, inviting friends and kin from miles around to their houses for a celebration to honor *MahaaLakshmi*, in the belief that she will cause the grain to be protected and even multiplied in the storage bins.

This festival is celebrated all over the Kingdom by almost all ethnic groups. Techniques of celebration differ slightly from place to place, but the purpose is the same: to appease *MahaaLakshmi* so that she may bless and keep watch over their harvest until the next year. Non-farmers also worship *MahaaLakshmi* during the same festival, *Lakshmi Puja*, but in their case their concern is to solicit her blessing for prosperity in

⁴¹ The *Bel* fruit is extremely hard-skinned, although inside the fruit is very tender and used in preparing many Ayurvedic medicines. It is believed that the protecting deity Vishnu resides in *Bel*, and that the tree has immortal qualities.

their business or other profession.

In the morning of *Lakshmi Puja*, the cow is worshipped as Lakshmi out of the belief most Nepalis hold that the cow represents Lakshmi, i.e., Mother. It is for this reason that cows are protected by Nepali law, the punishment for the crime of killing a cow being twelve years imprisonment. In only the recent past, the punishment was equal to that for human murder⁴². Cow dung (only of cows, i.e., females) is also used in all rural houses and buildings in Nepal to purify "mud" floor surfaces, and cow urine is sprinkled over any site, materials, or even a person for the same reason -- because it is believed that it purifies. Because cows are venerated for their purity and goodness, farm families feed them only *sattvik* (holy) food and avoid offering them *jutho*, impure, foodstuffs or residues of food that have been touched.

The day of *MahaaLakshmi puja* is actually the fourth day in the series of religious days known in Nepal as the *Tihar* festival⁴³. On the first three days, the crow, the dog, and then the ox are worshipped. And on the fifth day, Nepali girls and women worship their brothers. On all these days, people celebrate by preparing a great variety of foods from the new crops and fruits. All the worshipped objects, including the dogs, receive flowers and garlands, good food, rest, and comfort on their respective days.

Whenever rain does not fall during the right season, or if there is drought, the Nepali tradition is to call for rain. From his own experience, one priest from Dhankuta⁴⁴ described how:

Whenever there was drought in Dhankuta at least one person from every

⁴² The researcher's wife (Durga Pokhrel) dealt with a case of this kind. Charged with attempt to kill a cow, a woman (who was innocent) spent six years in jail. She had been sentenced to ten years in prison, but Durga petitioned and secured her early release.

⁴³ Celebrated as *Diwali* in India.

⁴⁴ This priest has recently moved from Dhankuta to another area, partly because his main *yajamaan* (client family) has also moved, and partly because he has adopted farming as his main livelihood now. For this reason, he describes this ritual in the past tense.

household would make the journey down to the holy Tamur⁴⁵ river. There, the *panditjees* and knowledgeable priests used to prepare 125,000 leaves of the Pipl tree and write a certain Vedic word on every one of those leaves. After that, some of the pandits and priests would wade into the river and begin chanting the *mantras* of the water god. Others would chant sitting on the riverbank and begin the work of a great *yagya* using pieces of cane and cow's milk. After this ceremony, which used to last several hours, all of the people would accompany us walking⁴⁶ fast or running back to Dhankuta chanting "*Hara Hara Mahadeva Paani deu deu*" (O! God of rain, Mahadev, give us rain!). By the time we stepped into town it would always start raining accompanied by thunder, and, in town, everyone would rejoice by pouring jars of water onto the streets.

This ritual never ever failed. It always worked then because during those times there were *satya*⁴⁷ people living in the community. Those people understood how humans should work with nature, and could convince the community as a whole to practice the rituals to which the gods in nature respond. Now, most of them have either died, or have moved to other places. A few knowledgeable people remain and practice the rituals by themselves just for the sake of keeping the traditions alive. But for ten years now social participation and its effect has stopped. Therefore, Dhankuta now faces trouble in agriculture.⁴⁸

The ritual described by this priest traditionally occurred in almost all regions of Nepal, and was believed to be very effective for the purpose of farming. Now, it appears that the practice is on the decrease. However, in the capital, Kathmandu, people still maintain a traditional annual ritual. Perhaps this is because the King himself participates in this festival. This Kathmandu ritual, *Raato Machhendra Nath* was cited by all the priests as a nationally famous agriculture-related festival. Following the priests'

⁴⁵ The Tamur is one of the seven tributaries of the Saptakosi river, one of Nepal's largest rivers that flows south from eastern Nepal to join the Ganges.

⁴⁶ "Walking" is how Nepalis describe even a steep ascent of 4,000 feet from the deeply dissected river valley back up to Dhankuta situated in a saddle astride a "low" spur joining the main ridge that winds northwards towards the Kanchenjunga massif.

⁴⁷ Truthful, pure of mind.

⁴⁸ One of the *satya* people that this priest refers to was the researcher's father-in-law. He died in 1983. One of his grandsons recently reported from Dhankuta that when his grandfather was alive and their family priest was still in Dhankuta, all the lands around their house were in cultivation. Now he has been able to plant only one tenth of that land.

suggestion, Sanjaya Dhakal (one of this study's research assistants) obtained a copy of M.M. Anderson's account of this festival published in a study of Nepali traditions, culture, and festivals (11). The account here is excerpted from that description.

In the Kathmandu valley, the rain god is called *Raato Machhendranath*⁴⁹. Lord Machhendranath is treated as the patron deity of the Kathmandu valley and is believed to have saved the farmers of the valley many times from drought. Anderson describes how his role began during the reign of King Narendranath Dev of Bhatgaon, when a drought had occurred for twelve years, causing tanks, wells, ponds, and fields to dry up, and bringing famine and pestilence to animals and humans. Anderson's account (p.54-60) records:

At last, after long meditation, the King's spiritual guide divined that it was a disciple of Lord Machhendranath, Gorkhanath, who had caused the drought by imprisoning all nine of the valley's rain-giving Snake Gods under Mrigasthali hill, near Pashupatinath temple. Gorkhanath prevented their escape by seating himself atop the hillock with the dual motive of punishing the valley people for neglecting to accord him due respect, and also to gain an audience with his divine Guru, Lord Machhendranath, who was then in deep meditation in the hills of Assam. For Gorkhanath knew that, while he dared not interrupt Lord Machhendranath in seclusion, this compassionate deity would surely appear when he learned of his people's profound distress.

Now the King's priest, too, knew that relief would not be forthcoming until Lord Machhendranath was persuaded to come to the valley, for then Gorkhanath would be impelled to leave his stronghold over the Snake deities in order to bow before his Guru. Thus the King of Bhatgaon and a learned man, Bandhudutt, from Kathmandu, together with a farmer-porter from Patan, set out to fetch Lord Machhendranath...

Along the route the party was joined by Karkot Naaga the Snake God, who enabled them to overcome obstacles and supernatural impediments placed in their path by powerful demons. As they neared the palace in Assam, Bandhudutt recited such powerful *mantras* and performed such efficacious religious ceremonies that Lord Machhendranath, despite attempts by his mother to prevent his leaving, transformed himself into a large black bee and flew into Bandhudutt's golden ceremonial vase....

⁴⁹ Actually *raato* (the color red) is the name of the festival in the city of Patan, in the Kathmandu valley, and in Kathmandu proper there is a *seto* (white) equivalent. The description here is of the Patan festival.

Now when the returning party entered Kathmandu Valley, carrying the sacred bee, they stopped to rest two miles south of Patan near the Nakhu River. When Gorkhanath arose from his hillock and came to pay homage to his revered guru Machhendra, all the Snake Gods were released and sent torrents of rain over the parched land and to the rejoicing people.... Then...the King ordered the town of Bungamati [lit. "on the birthplace"] built. The sacred vessel containing the Machhendra bee was enshrined, priests were appointed to worship it as God of Rain and Harvest, a great land endowment was granted for his maintenance, and ever since Bunga village has been known as Machhendra's birthplace.

Among the farmers of the valley, Machhendra is adored under his ancient name of Bunga Deo, the God of Bunga who presides over agricultural prosperity through his agents the Snake Gods... deep and abiding affection for this merciful God of Rain reflects the isolated valley's complete dependence in former years upon local food production.

They say that once the mother of Machhendra, testing his benevolence, secretly hid an insect wrapped in many folds of cloth within a small box. Next morning she found a grain of rice beside the insect, for Machhendra allows no creature to suffer from hunger. Then the mother knew her son was the deity responsible for existence of life on earth, and manifested herself as a pipal tree which grows today at Lagankhel in Patan.

In time a handsome temple was built for Machhendra at Tahabal near Patan's Durbar square. Clay was brought from the sacred hill of Mhaipi near Balaju to form his image, which was given life and soul through the recitation of magic *mantras*. A mammoth festival was instituted wherein the image was drawn in a chariot around the streets of Patan each year before being carried to his temple in Bunga village for an annual stay of several months.

Initial ceremonies start two weeks before the actual chariot procession, on the first day of the dark fortnight in April, when Machhendra's five-foot image, with red face and eyes benevolently lowered, is carried from his temple in a small palanquin to an open field, Lagankhel, in Patan where the party is thought to have rested when bringing him into the valley. Here, amidst thousands of cheering, adoring devotees the idol is bathed in holy water...

Now the idol is handed over to those who during the next few days perform ten ritual ceremonies for Machhendra which Newars themselves undergo. Idol-painters, always from a certain family, recolor Machhendra and repaint his features. Now he is carried back to his temple in the dark of night to await his installation in a splendid chariot waiting at Pulchowk area, ceremonies which take place on the first day of the bright lunar fortnight in April or sometimes in early

May.

On the fourth day of the same bright fortnight Machhendra begins a spectacular journey from Pulchowk through the narrow, rough stone streets of Patan aboard the creaking, cumbersome chariot whose towering spire sways precariously close to the several-storied buildings...

As the procession inches along the narrow lanes, hundreds of celebrating devotees swarm alongside and in its train to worship the God of Harvest. Those who pull the thick ropes of the chariot, or push it from the rear, consider it a sacred duty. Hundreds who cannot share this honor surge in just to touch the ropes, hoping thereby to receive the good fortune which befalls those who do the work. Bands of barefoot musicians and marching soldiers provide noise, music, and color, while excitement and religious fervor seem to charge the very air.

The great lumbering vehicles may progress only a few hundred yards each day and reach the final destination at Jawalakhel perhaps months later, depending upon the auspicious moment carefully calculated by astrologers as to when they may move forward... When the procession... passes Lagankhel, the chariots are made to circle three times the tree representing Machhendra's mother, an ancient form of honor and respect. On reaching Thati area there may be a delay of several days while astrologers calculate with particular care the timing of the last move to Jawalakhel, for upon arrival there 'the sun must be in the northern hemisphere'.

The climax of the celebration takes place in an open field at Jawalakhel any time between May or August. When the auspicious day arrives the word travels far and wide, as in all festivals where the timing is fixed by astrologers. They come by the tens of thousands, many keeping an all-night vigil, burning oil-wick lights in Machhendra's name...

People say during this holy day some rain 'must' fall as a sign of Machhendra's benevolence, and it invariably comes, bringing roars of joy from ecstatic crowds. Many who spend the day picnicking on the grounds dance with glee, faces raised to the gathered clouds, while others fall prostrate before Machhendra's chariot to kiss the dust on which it rests. No matter how fair the skies may be at the onset of [this day], it is a mistake to attend without an umbrella.

Before Machhendra leaves the field a priest climbs to the top of the chariot spire and drops a copper, bowl-shaped disc to the ground in an ancient ritual which is watched with great trepidation, for if it falls to the ground face down this is a good omen, foretelling rainfall and prosperity for the valley. But if it lands 'mouth open' to the skies, the people may suffer from hunger and want."

The priests' testimony, brief though it is, conveys both the significance of ritual in

Nepalese agriculture and the source of ritual in the Vedic concept of harmony with nature. It also communicates the importance and power of meditation, *mantras*, and ritual ceremonies, and the role of precise astrological calculation and collective observance of sacred duties by Nepali society in invoking the support for farming activity of deities believed to reside in nature.

Ayurvedic physicians

Below are recorded the responses of three Ayurvedic physicians:

"The simplest example of Ayurvedic principles in action is the avoidance of cold. If, in the cold season, somebody goes out without wearing warm clothes, he is definitely likely to catch a cold and manifest certain symptoms. The cure is to return to the rule, and make the person warm in warm clothes, and providing warm food, warm drink, and warm oil massage. In addition, certain plants possess the quality of warmth, and, if their infusion is drunk, or their extract rubbed by massage, they are able to kill coldness and restore warmth. Through this kind of knowledge of natural laws, a patient can be brought back to normal health.

"*Rigveda* (1.23.19) mentions that the curative power of water reflects its quality as nectar of immortality. To rehydrate a patient, it is better to use water, or natural vegetable or fruit juices, than an intravenous solution. The I.V. might appear to work faster, but rehydration with natural water will cause a slower, but more subtle, recovery.

"Although Rigvedic treatment involved mainly the use of plants and holy recitations, surgery was also practiced. There are references even to the repair of leg bones and hip joints by using iron (*Rigveda* 1.11.15). Rigvedic physicians had knowledge of anatomical and physiological terms, biological ideas, and treatment methods, and of the origin of life and disease. The same source also describes how an old Brahmin woman was made young.

"Since the inception of modern development in Nepal, the only reference to Ayurveda in the government's agricultural plans is the protection and promotion of *Jaributi* [herbal plants]. But the *Jaributi* concept has been treated as though it is of

minimal significance. It could be that policy-makers include this provision only keeping in mind one particular medicinal plant *chiraito* which Nepal exports to India and Germany for production of quinine. Yet there are endless medicinal herbs produced by Nepali farmers, some of which they keep and use for themselves, but most of which they market outside the country on an individual basis. If the government would integrate this into its agricultural program and encourage the producers, Nepal could recover her economy.

"On the question on balanced diet and its relationship to health, a fundamental concept in Ayurveda is that, in order to avoid illness, people should eat a balance of food types which do not contradict the nature of each season.

"To keep this concept alive, nature also has to be intact. But, nowadays, pollution of the environment is itself causing disease. The harmony of nature seen in the Veda has been disturbed. Along with balancing diet in relation to the seasons, we have to pay attention to balance in nature itself.

"All farmers, big and small, routinely grow varieties of medicinal plants and herbs while they plant other crops. For instance, in the hilly region, many farmers grow *Asuro*, out of which they prepare cough syrup which helps to reduce fever also. And in the *tarai*, farmers plant *Neem* which everybody there eats mixed in with vegetables, as well as by itself. It is very effective against malaria, and has many other good qualities. People who cannot afford to buy a toothbrush chew *Neem* twigs everyday to clean their teeth. Using it makes the teeth and gums very strong. In the hills they use twigs of the *Kadam* for teeth cleaning. Also, from *Kadam* seeds can be prepared an ointment which aids the healing of cuts.

"What we are saying is that farmers are already aware of such things in a limited way. The problem is that the big people who are trained in places like America no longer recognize the existence of our own methods. Therefore, there is no provision for their encouragement. People trained under the Nepali education system are no better because that system also has forgotten these things.

"For the economy to recover, Nepal has only one chance: to start encouraging

production of medicinal plants. By doing this, if Ayurvedic industries are established in various parts of the country, that will solve Nepal's internally required medicines and tonics, and we can export surpluses to people interested in the West.

"The government's policy in Ayurveda is limited to one organization, the *Sri Panch Ko Sarkar Ko Vaidhyakhan* (His Majesty's Government's Ayurvedic dispensary) which has become very ineffective during the past years. One small hope is the training center for Ayurveda which has been converted into a college under Tribhuvan University. If such colleges would be established in various parts of the Kingdom, that would counteract the shortage of doctors in remote areas, and by having Ayurvedic practitioners in every locality, that would encourage the production of herbs and local medicines.

"To provide health facilities to all Nepalis, Ayurveda is the only feasible technique for Nepal. Even if some people do not accept Veda as the source of Hindu religion, we do not see any reason why anyone should not accept Ayurveda which has nothing to do with religion because it is the pure science of health."

Astrologers

"The relationship between astrology and agriculture is like flesh and nail. Until a farmer knows the right time and day to sow his seeds, he should not act. He is dependant on astrology for the right kind of rain forecast and the right *Muhurta* for doing any activity. *Muhurta* is the exact right time calculated based on astronomy, that is according to the position of stars in relation to the planets, and mathematics. Nepali farmers are either aware of these phenomena intuitively because they have been practicing for generations, or if necessary they consult the local *Janne*⁵⁰ to find out the *Muhurta*.

"Doing things in the right *Muhurta* is the established tradition for all Nepalis, and especially farmers. But although the tradition is based on astrology, many of them might not be aware of it because most farmers only consult their priests or *janne* who also

⁵⁰ *Janne* means "Knowledgeable One", and is a rural Nepali term not necessarily applied only to astrologers.

possess some basic knowledge of astrology. Mostly it is they who suggest the right times for farming activities. Because astrology is not a major profession, we are all farmers following astrology while practicing our agriculture. When we say agriculture, that always includes animal husbandry also. When a person wants to buy a milking cow or a buffalo, he consults an astrologer in order to decide what might match his family's stars.

"Once a man from my village had eleven black cows and eventually all of them died. He was so sad because he loved cows. I looked at his birth chart carefully and discovered that he should not possess black cows, or any black animal. So he started keeping ginger-colored cows. Within a couple of years they doubled in number, and since then he has had no problems.

"Astrology enters the picture from birth to death in a person's life. All marriages which are not done according to the astrological matching of the boy's and the girl's charts end unhappily. In the past, one hundred percent of marriages in Nepal were arranged by parents or guardians according to astrological matching of the couples' birthcharts, and they were all successful marriages. These days, even in Nepal some people have started the practice of "love-marriage" as in the West which is resulting in unhappy marriages. Even "divorce" has started in our country which was unheard of until recently. The reason we give this example is that whether it is people, or pet animals, or plants, while establishing relationship with other elements in the universe, astrology explains and can predict the type with whom the best-suited relationship can be established.

"In Nepal, except for drunkard people, all consult the astrologer for any kind of decision. Astrology has always been able to forecast natural disasters and social calamities also. If people around the world would pay attention to it, there would be no loss of life. But leaders are not aware that they can link astrology with administration. Yet all in higher positions, starting with the King, consult the astrologer for their personal affairs.

"Concerning problems like drought or too much rain, and agricultural production and natural resources, there is much advice in astrology. But the use of its advice

depends on other happenings. That is to say, astrology can only predict things. To make predictions happen, or not happen, is a matter of people's consciousness.

"One thing we can tell you is that if Nepal is to prosper, the leaders must consult the real, knowledgeable astrologer and work accordingly. The astrologer can make the birthchart for any institution or project of the government, and predict its success or failure. With proper attention to *Muhurta*, unsuccessful projects can be prevented from happening. The astrologer can provide suggestions for each and every office, and for individual office holders -- what the King should do, what the P.M. should do, what the agriculture minister should do. The best suggestion we can give is for one astrologer to be appointed to the National Planning Commission.

Farmers

Altogether, 57 farmers responded to the interview questions. The farmers belonged to all four *varnas*, and were representative of several specific ethnic groups including artisinal castes and *tarai* tribes.

For the purpose of this study, the farmers have been categorized by ecological zone, i.e., hill and *tarai*. Where relevant, specific *varna* or ethnic experience is noted.

The hill farmers. Among hill farmer respondents there were Brahmin, Kshatriya, Limbu, Rai, Magar, Kami (blacksmith), and Damai (tailor). Regardless of ethnicity, the hill farmers all said that they celebrate various rituals during harvest time. First of all, the farmers consult a Brahmin (priest) to choose a good day, whether it is for sowing the seed, planting seedlings, or harvesting the crop. Then they perform individual family rituals by lighting incense before their *Ista Deva* (personal deity) to seek good fortune.

While transplanting rice seedlings, all farmers worship *Naag* (the Snake god) by offering some rice plants. On a family level, Limbus perform *udhawli*⁵¹ *puja* by

⁵¹ Literally, "downwards", meaning that all rice planting is done "down" at lower altitudes. The ritual ceremony is believed to offer protection from evil while going "down".

sacrificing five or six chickens to satisfy their *Devi* (goddess). This ritual is performed through a *Dhami* (witchdoctor). The Rai's ritual is called *Chauwa* and is also performed through their own caste *Dhami*.

All castes engage in the social ritual of puddling and planting the rice paddy. Some give it the name *Bethi*. According to this ritual, all the farmers of a particular area's paddy fields gather and invite five *Damai* (tailors) with *Panchebaja*⁵² instruments, and then all the farmers and their helpers, whether paid, or exchange labor, dance in the mud of the paddy as they start planting the rice seedlings. They work in three rows, the first row handling the ox plow, the second *Bause*, who stir the mud with their feet, and lastly the *Ropahai*, the planters, who are mostly colorfully-dressed women.

The fifteenth day of the month Ashad is the traditionally good *Muhurta* for starting rice transplanting. All over the country people celebrate Ashad 15 by eating flattened rice and curd. Such rituals are believed to satisfy different spirits and gods/goddesses, and are performed at other times also, such as while tasting the new crop and storing the harvest in the house. Limbus perform *Ubhauli puja* when they go "upward" to the village to taste the new crop. Brahmins give one *paathi* of rice to a virgin girl⁵³ before storing their crops.

About farming techniques, a group of mixed farmers living near an agricultural research center⁵⁴ stated that they practice traditional and new methods "fifty/fifty". Their practice of newer methods of farming is due mainly to the influence of this center which provides assistance with hybrid seeds, plant protection chemicals, and many other

⁵² *Panchebaja* is a combination of five national Nepali musical instruments which are played particularly by Damai caste musicians during any important festivity, such as a wedding.

⁵³ Virgin girls are considered in Nepal as incarnation of *Kumari*, the "living goddess".

⁵⁴ Pakhribas Agricultural Center (PAC) near Dhankuta in eastern Nepal is a British ODA-funded and managed center originally established as a British Gurkha Reintegration Scheme. It now provides technical services to HMG's natural resources programs throughout the most eastern hill districts of the eastern region.

inputs. All other respondents stated that they practice only traditional methods.

All the respondents cultivate their lands a minimum of twice a year for the rainfed, dryland/upland "*bari*" fields on the hillsides, and three times a year at lower altitudes where the "*khet*" land receives irrigation. On unirrigated *bari* terraces the major crops reported were maize plus stringbeans, finger millet, and mustard, while on *khet* fields, the predominant cropping patterns were paddy and maize, and paddy and wheat. Along the *khet* terrace walls various kinds of pulses are grown. In addition, many other crops are grown, sometimes on a smaller scale nearer the farm houses, including potatoes, ginger, yam, groundnut, buckwheat, garlic, onion, turmeric, and a great variety of seasonal leafy vegetables and fruits.

All farmers reported that the production from their lands was insufficient for their families' livelihood. For this, they used the expression "*khaana-laauna*" ("to eat and to wear"). Basically it means to eat and to "get by", implying subsistence or basic needs. Thus, besides staple food, it refers to some clothing to cover the body, and other purchased essentials like sugar, oil for lamps, salt, and cooking oil. Most responding farmers reported that only about one quarter of their neighbors produced enough from their land to cover *khaana-laauna* for the whole year; half the neighboring households had enough for eight to ten months of the year, and the remaining quarter of families produced enough for half a year or less. To make up the deficit in food supply, many Brahmin farmers stated that they performed part-time *yajamaan karma* (priestly services), blacksmith caste farmers reported that they make all kinds of iron utensils like scythes and *khukri* knives, and *Damai* undertake tailoring for others, especially during the *Dasai*⁵⁵ festival, when it is the custom to wear a new suit of clothes. The remaining farmers said that they work as field laborers, borrow from moneylenders, or seek employment as porters.

⁵⁵ *Dasai*, or *Dashera* in India, is the biggest Hindu festival of the year commemorating the Goddess Durga's fight and victory of good over evil and ignorance.

All the farmers commented that in their area a government JTA⁵⁶ had visited only once or twice in the past four or five years, and had suggested simply that farmers should use chemical fertilizer which they had never received from any government source and never used. The farmers nearer to PAC in eastern Nepal said that they had been visited by the center's JTAs once in a while and had been provided with modern fertilizer and hybrid seeds, but in a limited way. So to a greater extent they are dependent on their traditional techniques of farming. Their only traditional source of fertilizer is animal manure and *Rachhau*⁵⁷ from their house.

23 out of the 34 hill farmers stated that there is a vast difference between the old *Panchayat* system and the new democratic government. During the old system, any government assistance extended for the benefit of farmers first had to physically reach the local *Panchayat* man's house, and only what was left would be distributed at his discretion. Now, there are noticeable improvements in health service, schools, and postal services which all indirectly help farmers. Of direct help is the new government's improved administration of agricultural loans by the National Commercial Bank.

16 of the farmers said that democracy is only just born and that it takes time for improvement to be felt. The remaining eleven farmers commented that there has been no significant change in terms of reforms by the new democratic government, but that they will "wait and see".

Regarding the Kathmandu Valley's fertile agricultural land being sold for housing purposes, respondents familiar with the valley⁵⁸ responded:

The problem of the Nepal government in the past was lack of town planning and agricultural planning. As the government centralized all offices in Kathmandu,

⁵⁶ "Junior Technical Assistant", the field-level extension worker.

⁵⁷ *Rachhau* is the catchment area outside the farmhouse below the place where dishwashing is done. In it collects the mixture of wood ash (used as the cleansing agent in dishwashing) and food residues, which eventually forms a pile of fertilizer.

⁵⁸ Farmers near Pakhribas in eastern Nepal did not respond to this question about the Kathmandu valley.

everybody had to move there. No matter how little land there was in the valley, everybody had to have a residential plot there. As the government had neither a housing plan nor any agricultural plan for the valley's farmers, sales of land for housing plots became a matter only of negotiation between buyers, the migrants to the valley, and sellers, the farmers. Most of the buyers who bought the bigger plots of land were business people and *Panchayat* leaders and senior bureaucrats who made money through corruption and smuggling of drugs and antiquities to other countries and gold into Nepal. We urge the new government to investigate this and find out how they obtained so much money to buy those lands⁵⁹. The same type of government leaders and businessmen finished Nepal's forests during the *Panchayat* period, much of it sold as logs to Indian timber merchants. At the same time, population pressure grew.

Several things need to be done. If the government would decentralize the central level offices to more remote areas of the Kingdom, this would force officials to move out of the valley and at the same time cause infrastructure to be developed outside the valley.

Secondly, proper town planning should be done in Kathmandu, with strict regulations applying to town development so as to save the fertile land for agricultural purposes. Thirdly, to make Kathmandu more self-sufficient in agriculture, mixed farming should be encouraged and the small farmers should receive more help especially with the establishment of agro-industries and agribusinesses.

On the subject of seasonal food consumption, health, and medicinal herb harvesting, all farmers reported some knowledge in this area. Common knowledge is the value for health of eating maize during the season when it is succulent, and finger millet during the winter season. Many medicinal herbs are known and used for disease control. *Padina* cures cholera; *Neem*, *Bojho*, *Sisnu* (nettle), *Titepati*, *Timur* are all valuable for curing various infectious diseases. Farmers keep, and plant, all these kinds of plants on their land in a limited way.

The farmers' complaint was that there is no government policy helping them to grow these plants. Some said, "Instead of exporting a narrow range of plants, the

⁵⁹ Land prices in the Kathmandu valley skyrocketed particularly during the 1980s. Plots now fetch half a million dollars an acre anywhere reasonably close to Kathmandu or Patan.

government should encourage farmers to grow more and establish Nepal's own processing industries." Unless the government takes initiative, or other interested people who have the resources, "we poor farmers cannot do more than the little that we have been practicing for generations."

Hill farmers' knowledge and opinion on the Vedic tradition was distinctly divided. Brahmin farmers stated that all they knew was that there had been a strict caste system in place since the time of their ancestors. In this system, if higher castes -- especially Brahmins -- were found associated with lower castes, they would lose caste. Even the government used to punish people who did not follow their caste *dharma*. In villages even now, society is divided according to castes. "We do not fight, but live peacefully. We Brahmins use other castes as agricultural laborers -- including untouchables. We do not go to labor on untouchables' land, but we help them in different ways. In such social arrangements, we manage ourselves. It is not that the government needs to do anything."

Among other castes, Kshatriyas stated that they did not know anything about Vedic traditions. Again, all they knew was the present reality of the caste system. Rai farmers reported that they had suffered much because of the caste system, and did not know that in the Vedic time there had not been a caste system. "If regulations are introduced to equalize castes, at least while doing agriculture, progress in Nepal would be faster because we are all farmers regardless of caste. Now the reality is that higher castes have more land, power, and influence, and receive more help from the government and more fruit from agriculture. There should be equal opportunity in farming, regardless of caste, ethnicity, or any social status. If Vedic tradition provides such equality, we will take it."

Finally, Limbus stated that they did not know about the Vedic tradition, except that in the old days people did not have "consciousness". They were "jungali" [wild]. Maybe because of being jungali, they did not have any sense of caste or untouchability. They did not know much about proper agricultural practices and used to eat whatever was edible in the forest.

"Population was little in those times, soil was fertile, and, because of the thick

jungle, the environment was pure and healthy. Because the land was naturally fertile, agricultural production was more than they could consume.

"For the development of Nepali agriculture, farmers need hybrid seeds, chemical fertilizer, pesticides, subsidies, and a JTA in each village. Also, His Majesty's Government should introduce a strong population control policy, educate people about taking care of the environment, and stop the logging merchants from cutting trees. Irrigation facilities are needed even in the remote areas of the country, and all farmers should have access to safe drinking water. For these things, the government should enable farmers to organize themselves to look after their natural resources.

"While providing agricultural loans, the government should assess the needs and provide loans to the needy farmers, ensuring that the farmers spend the loans only on the purposes for which they were borrowed. Poor farmers should be exempted from interest if unable to pay. Every month the government must collect accurate information from the farmers and follow up the loans. Farmers should receive more training and opportunities to tour other parts of the country to see better agricultural methods. Soils should be tested and arrangements made to plant those fruit trees suited to the local ecology, along with training for the farmers.

"All excess production should be marketed to other needy places in the country. To curb migration from the mountain and hill regions, the government should develop more infrastructure like roads, electricity, communications, and a health post in each village. If the government would help farmers in these ways, they could produce more than their subsistence requirements and thus help develop Nepal."

In addition to the Limbus' suggestions, other farmers urged the government to encourage local technology more, and, while buying fertilizer, only to buy those types that do not destroy the natural fertility of the soil. To improve the availability of government services and technical help during the season, there should be depots and stores right in the village. They also asked for government loans to buy oxen and iron for plowshares. At the same time farmers should be granted permission to cut those trees needed for making wooden plows and related implements used with draft oxen.

Tarai farmers. All 23 *tarai* farmers without exception stated that while performing any agriculturally-related work they perform social, spiritual, and religious rituals. All stated also that the most important rituals are performed at the onset of rice transplanting and while harvesting. All of these farmers celebrate *Shri Panchami* in the month of *Magh* (February). On this day, they worship the earth, the plow and all their other agricultural implements, pray for a bountiful harvest, and eat good food and wear nice, clean clothes in order to establish a positive influence which will carry through the whole year, helping to create good crops.

Before cutting paddy, they also celebrate some social rituals of thanksgiving for good food. Some farmers referred to celebrating on the first day of the month *Baisakh* -- the Nepali New Year in April -- by planting new trees and worshipping for a good year on the farm. During this festival, the farmers celebrate together with all their neighbors. Although knowledge of the rituals involved in this festival is passed down from their ancestors, they still select the right date and time by consulting the Hindu priests.

All the *tarai* respondents reported that they practice a mix of traditional and modern techniques whenever the latter are available. Some expressed skepticism about using chemical fertilizer, stating, "because this decreases the fertility of the soil, we use only our own animal manure. We are equally involved in animal husbandry for milk, curd, and manure." Some *tarai* farmers have introduced gobar gas plants to convert animal manure into gas for cooking and lighting.

Most of the farmers said that they have two crops a year of paddy, and one of wheat, as their major crops, as well as minor crops of lentil and jute. Five respondents indicated that they grow four crops a year based on irrigation from their own tubewells and pump sets. These farmers mentioned producing rice, wheat, maize, jute, mango, cucumber, grapes, lime, various squashes, *lapsi*, lichee, bananas, tobacco, and many varieties of leafy vegetables. These five farmers stated that they produce sufficient for their "*khaana-laauna*", sometimes even selling surpluses and saving the income. Other farmers who use both modern and traditional technologies stated that they did not have enough for *khaana-laauna*. *Khaana* was "sometimes enough", but *laauna*, "not at all".

For extra income, men travel as far as to Punjab, India for agricultural labor unless there is laboring work available in Nepal. Some carry loads (portering) for others. Women also make extra income by working as laborers for large farm holders, or as maids on an hourly basis. All reported that if more irrigation were available, they could have produced sufficient crops for their year-round *khaana-laauna*.

Most respondents said that JTAs visited their areas occasionally, sometimes even monthly. However, the farmers' complaint was that JTAs gave only advice rather than materials. Some added that some young JTAs are not experienced and their suggestions contradict what farmers have been doing for generations, so they do not follow their advice.

Comparing the government's facilities now with what they were like during *Panchayat* times, the farmers have not seen much difference so far, except that now "we can all say what is in our minds. One great progress is in agricultural loans the interest on which is now forty-percent subsidized. During *Panchayat*, interest was even calculated on interest. Also, fertilizer and seeds are more available now, and at a cheaper price."

"About selling Kathmandu Valley land, the government must introduce strong legislation to evaluate the land and reserve the fertile land only for agricultural purposes. Without such legislation, even if irrigation facilities are provided to the valley farmers, the land may still be sold. The government must also encourage the farmers to plant fast-growing trees and shrubs in their terrace banks for the cattle. At the same time, the government should conduct research into producing more from less land. Further, if there is insufficient land for individual housing, then the government should make regulations so that houses are built with many stories, with different families living in different stories⁶⁰.

Without exception, all *tarai* farmers have heard Ayurvedic physicians talking about good food and the use of medicinal herbs for good health. Every respondent cited some specific herbs that they used, such as:

⁶⁰ This observation of these farmers is very interesting because, so far in Nepal, there has been no such thing as apartment or condominium blocks.

For worm infestation we eat *Neem* leaf, or infuse *chiraito* in boiling water and drink the juice.

For a cut or bleeding wound, the bark of *Neem* or *Pipal* is used, ground into a paste and applied directly.

For cough, *Tulsi* or *Padhina* leaves are boiled in water and drunk.

If snakebite is suspected, lime juice is applied; if the juice turns black, that confirms the bite.

Bojho roots are chewed for sore throat.

Fresh ginger and salt are eaten to relieve stomach ache.

All these farmers reported that they planted such medicinal herbs in their gardens, and that there were many more medicinal plants in the jungle before it was destroyed in recent years. Now they cannot find those varieties wild anywhere. Unfortunately, they had not planted them in their lands before they disappeared.

These respondents did not seem to have any understanding of the Vedic tradition. Most of them referred to the Vedic period as if it was one or two hundred years ago, during which time there was untouchability and the caste system. All of them stated that there was nothing wrong with the caste system. "This is our society, and it is a flower garden of *char jaat chhatis varna*" (four castes and thirty six *varnas*) ⁶¹. Most respondents stated that this social system is the foundation of Hindu *dharma*, and that there is nothing bad about it.

Referring to the last two questions in the farmers' interview schedule, the farmers' responses were mostly related to what needs to be done for the better of their farms. Few responded to the idea of meditation, and even these responses may have reflected a broader understanding of the Nepali word, *dhyaan*, which means not only meditation, but "attention". This would explain the respondents' comments that the government should give more "*dhyaan*" to the farmers, and that farmers should pay more *dhyaan* to what the government people say and act accordingly.

⁶¹ This was a famous remark the unifier of Nepal, King Prithvi Narayan Shah made in 1771.

All respondents commented on what needs to be done to make Nepal's agriculture more prosperous. All gave first priority to improving irrigation. Their second priority was transportation and agricultural equipment. After these priorities, more frequent JTA visits during the farming season were mentioned, and more easy, and timely, availability of agricultural loans for their needed purposes. About acquiring fertilizer, farmers were divided equally, some preferring chemical fertilizer, and others natural compost/manure. Those favoring natural manure wanted more government help for the purchase of cattle. Several of these farmers mentioned that the leaves of medicinal plants, like *Neem*, "doubles the fertility of the land if mixed with cowdung compost".

The farmers' next priority was electricity supply to their houses, and the initiation of some local, agro-based small-scale industry. Other developments suggested were adult education on more effective ways of farming and family planning which "include women", and guidance from the government on ways to "keep the environment good". Ten farmers also mentioned government help with marketing, stating that because of insufficient storage space for their production they needed to be able to sell during harvest time and save the income for buying food later as needed.

Overall, there appear to be few essential differences between hill and *tarai* farmers in terms of the role of religious and spiritual rituals in the approach to farming practice. *Tarai* farmers were not identified by caste as hill farmers were, and their rituals appeared quite similar to one another. In the hills, also, the purposes of rituals were very similar, but, based on the respondents' information, there seems to be some variation in ritual names and in the techniques of ritual performance.

Hill farmers were more vocal about the reality of the caste system and its acceptance as it is in society. However, caste did not seem to be a major hindrance to farming practice.

In the *tarai*, JTAs' visits were more frequent than in the hills, although, in the Pakhribas area, farmers have more exposure to new technologies than elsewhere in the hills.

Neither group of farmers, hill or *tarai*, were conscious of the Vedic tradition -- even Brahmin farmers. Farmer awareness was limited to the traditions established during the conservative Hindu period following Muslim rule in India. In particular, it appears that Limbu farmers think Vedic people were people of the stone age. None of the *tarai* farmers seemed to have had the experience of "lower" caste suffering such as that mentioned by hill Rai farmers.

Hill farmers appear to be more conscious about their traditional practices than farmers in the *tarai*. This could reflect the *tarai*'s closer proximity to the Indian border, and therefore the influence of Indian traditions and relationships.

Both groups urge greater government action in helping farmers, in some cases providing very specific suggestions. *Tarai* farmers appear more inclined to accept some modern technology than hill farmers.

Nepali agricultural professionals

Nepali agricultural professionals who responded seemed to fall into one of two types as far as knowledge of Vedic traditions was concerned. The first type admitted to having no Vedic knowledge or idea about Vedic traditions relating to agriculture. The second group could cite the names of the four Vedas, and were also aware that the last two, the Atharvaveda and Samveda, are sources of inspiration for agriculture.

The first group state that although farmers perform rituals in connection with their farming activities, in their opinion, that does not mean that cosmic or sacred awareness is necessarily significant. This group believes that indigenous agricultural knowledge in Nepal is largely based on the farmers' experience gained through generations of farming. At the same time, this group also states that farmers are conscious of cosmic/sacred dimensions of traditional practices. But it has just become a tradition to follow the rituals. Not many farmers know or understand the reasons for them, and, as far as this group is aware, farmers do not consult priests or anyone in particular for their farming activities. Nevertheless, this first group of professionals did list the rituals that farmers perform, but as it was very similar to the rituals that priests and farmers explained, it is not repeated

here.

Although the second group of professionals mentioned the *Atharvaveda* and *Samveda* as the source of inspiration for agriculture, they did not view cosmic and sacred awareness as significant. In their view, farmers attach more importance to the ritual aspect than the spiritual. They added that while consulting pandits and astrologers to decide farming practices is rare, farmers do consult these traditional specialists when purchasing land or any fixed capital.

This second group gives one example of traditional wisdom in agricultural practice today. They say that farmers in Kathmandu Valley plant their early variety, low-quality rice in the rows nearest the edges of their fields, leaving the main varieties more towards the field center. The purpose is to protect the main crop from rat damage, on the assumption that the rats will be attracted to the early varieties and collect enough grain from them to fulfill their annual demand. The second group has skipped interview questions 4-8, saying "no idea, sorry". However, the first group while admitting to having no idea of Vedic traditions or their relevance to agriculture responded to these questions more specifically. They say that:

In the villages the priests, *jyotish* (astrologers), witch doctors and the older people are generally considered to know the rationale for following certain rituals. But farmers might just ask what is good and what is bad -- the reasons or rationales for these are never questioned. There are *pandits* in the villages who know the Vedas. These *pandits*, however, perform only the usual *pujas* and sometimes tell Vedic stories (*Purana*) if invited by farmers.

These *pandits* and others (especially Brahmins) are mainly consulted for advice on religious matters. As far as farming and natural resource management is concerned, they are not necessarily the "opinion leaders".

Perhaps because of present agricultural extension programs, and political and social awareness, more people are now talking about new seeds, fertilizers and cropping intensification. Nobody in the villages is consciously advocating or promoting the traditional knowledge system. It is just passed from one to another generation, more by following tradition.

While changing the traditional practices to new innovations, the biophysical and socioeconomic factors play a more important role than the sacred/cosmic ones.

Farmers would adopt new innovations if it is economically viable (profitable), culturally acceptable, technically feasible. However, there are some traditions that farmers still maintain. For example, farmers say that they themselves should not plant weeping willow and bamboo in their fields. They call their neighbors to do the job for them.

The rituals that farmers follow are routinely followed in all respects. But when it comes to deciding on a new practice (i.e., a Western technology) this group says that they have not seen any ritual being followed. One of the respondents of this first group, who works as an agronomist for PAC responded:

We observe all the rituals in our farming. I am not conscious of any sacred/cosmic awareness affecting the natural laws. However, a major emphasis at PAC is to try and explore the indigenous technical knowledge (ITK), utilize the local resources, i.e., green manuring plants such as *titepati*, *asuro*, *sinis*, etc., and improve the efficiency of compost/farm yard manure. Utilization of local germplasm and local strains of *rhizobium* are also being looked into. Personally, I respect nature, and would like to go along with it, not against it.

About the existence of traditional organizations, both groups say that there are some, but that they are "informal". The first group states that, "In the hills, such organizations manage forests, irrigation channels, and other common properties. But since the forests were nationalized, there has been no need for community organizations to manage them. In Newar society, an organization called *guthi*⁶² is popular which is mostly responsible for social and cultural matters. However, because of historical political/governmental interference, these groups are less active now." The second group comments that local political people who are also government functionaries are often members of traditional organizations.

Both groups also state that Nepal's policy has been "transfer of technology" to satisfy the donor agencies. However, a new method, "rapid rural appraisal", has been adopted by some agencies in the government as well as by nongovernment organizations, which is geared towards understanding the problems and needs of the farmers first, and to preparing programs accordingly. Recently, attempts were made to carry out a socio-economic survey in which one of the agenda items was to identify perceptions of farmers

⁶² Temple society.

about their own farming conditions. Unfortunately, no information was obtained in that survey on topics relating to indigenous knowledge.

About the issue of conflict between modern and traditional technology, the second group states that modern technologies often conflict with traditional ones. Farmers are sometimes reluctant to use them if they are quite different from their usual practice. For example, they say that farmers do not apply potassium fertilizer as they believe that it will not improve productivity. Generally, higher caste farmers follow modern techniques on a larger scale than their lower caste counterparts. This second group has also stated that "modern methods have in due course of time degraded the natural resources, resulting in low sustainability of production systems." The first group, however, says that they have not come across any major conflict between modern and traditional technologies because the recommended practices by extension/research programs are largely based upon the farmers' needs. Examples of the kind and degree of conflicts that have occurred, according to this group, include:

Until recently, all maize recommended was yellow seeded. However, the hill farmers like white-seeded maize because it resembles rice which is a prestigious crop.

Short statured wheat that responds well to fertilizer is recommended by CIMMYT and national programs. However, farmers need long straw that would also be succulent because they feed it to cattle.

Pokhreli masino rice, which is fine, long grained, and soft was recommended to the midhills by PAC, but it was rejected by the hard-working farmers. They reported that since it was tasty they tended to eat more of it, and since it got digested quickly, they felt hungry soon while working in the field. They wanted something more stable, a coarse type. Pokhreli masino is preferred by rich farmers and by farmers near to district headquarters⁶³.

⁶³ As in other parts of Asia, a narrower range of higher yielding, higher external input-demanding rice varieties were popularized under the Green Revolution in Nepal. Traditionally, Nepalis use a wide range of varieties of rice which are classified Ayurvedically in terms of their effect on physiology. The delicious *Basmati* strains of rice that Asia exports to the West rank only third or fourth in this indigenous Nepali rice taxonomy. There are even more aromatic varieties that possess an enlivening *sattvik* influence. Highest in this ranking is *Krishna Bhog* ("fit to offer Lord Krishna") which

This first group does not agree that any particular caste tends to adopt modern technology more than others. They state:

Agricultural practices both traditional or modern are seen to be affected more by the agroclimatic condition of a place rather than the ethnicity. For example, in high altitude areas, all farmers grow potato and maize, plant the crops at the same time, perform the same agricultural operations, and utilize it in the same way. Similarly, in the *tarai*, all farmers grow the same crops and perform similar operations.

The traditional knowledge and varieties are being lost gradually in crops like wheat in the hills because it was not a major crop before, and introduction of high yielding varieties is replacing the existing ones.

In the recent past when there was plenty of fertile land available, fewer human beings, we might have had that Golden Age. Almost all the hill farmers are performing the same rituals, same traditional practices in agricultural production, but still the downward trend in production continued. This is not because farmers have abandoned the traditional wisdom. The degradation in the natural resource base and the effect on agricultural production is largely induced by the population pressure.

Both groups agree that the best path to sustainable development in Nepal must involve a combination of IK and modern technology. To quote the first group:

A marriage between the modern science and technology and indigenous knowledge would be very appropriate. Both are not sustainable in the long run. The sustainability of modern technology should be increased by properly utilizing the indigenous knowledge.

So far, most policies are based upon the transfer of technology model entirely. There is no provision and mechanism to utilize or develop the indigenous knowledge. Because of this, the following dangers may be encountered:

a) The subsidy on chemical fertilizer, every year, costs the government a lot. Improper use of fertilizer, e.g., of Ammonium sulphate and urea, is suspected to decrease the soil pH and make it acidic. The soil structure is also deteriorated due to improper use of fertilizer -- many farmers assume that chemical fertilizer is a

farmers also call *jeerasari* ("as small as cumin") because before husking the grains are small and dark in color. When cooked, *Krishna Bhog* has the finest natural aroma, almost like *ghee*. Although it yields less in terms of paddy, it swells much more than other varieties when cooked, and gains in quality when stored for more than a year.

substitute of farmyard manure/compost and they tend to use only chemical fertilizer if it is available.

b) Due to the lack of proper instructions and equipment for using chemicals (pesticides) farmers are suffering. Although the immediate danger is not widespread, its long-term hazard to human and animal health cannot be ignored.

c) Promotion of a single species in forestry plantation under community forestry programs could be dangerous. If the species suffers from some pest it could be wiped out entirely. The natural biodiversity in forestry (of different species) is not followed. One can see forests full of pine trees only.

Perhaps the pressure or program/policy of technology transfer model was introduced by the aid donors. The Integrated Cereals Project introduced the production programs, cropping pattern tests, key informant surveys. The national crop research programs also copied the model advocated by the international centers which is largely the Green Revolution transfer-of-technology model.

Recently the researchers are realizing the fact that more farmer participatory research should be initiated. Alternative approaches are now being practiced.

The recent advancement in agriculture, e.g., genetic engineering, gene transfers, etc. has got nothing to do with the traditional or indigenous knowledge of farming in Nepal. Among the researchers in Nepal recently the importance of indigenous knowledge is increasing. Interaction with scientists from different programs, seminars, journal articles, etc. has been very influential in this respect.

There is no pressure that prevents from applying indigenous knowledge in Nepal. Perhaps the university/ college education itself is responsible for motivating people to start looking for modern alternatives.

Nepali farmers are wise enough not to adopt every modern technology as such. They are very cautious in selecting technologies. They might listen to the extension workers, but if they think that it is not to their advantage they simply ignore it and continue with whatever they have been doing.

There is no policy to offer Nepali farmers a choice between modern or traditional options. It is up to the farmers themselves.

The PAC agronomist made the following comment:

Agricultural researchers should first try and understand the traditional practices. Many practices have become a tradition, the rationale behind them has been lost. Therefore, validation of traditional practices might also be important. For

example, farmers use moist compost for potato planting, use small eye pieces to large pieces to whole tubers, and de-sprout the tubers before planting. When asked, farmers simply say it is the tradition. But when this was researched by one of our agronomists, it was found that the moist compost provided enough moisture for tuber germination since potato is planted in January-February when the soil is a bit dry. Eye pieces were suitable in moist soil, while in dry soils they would soon dry, so large pieces were needed. These findings have important implications for our research.

The same person also comments about meditation:

It sounds like a religious thing to me, which would have very limited impact on the farming communities. It would be even more difficult to relate it to farming practices. Perhaps there are alternative ways to raise consciousness of farmers which would not be as complicated as meditation practices. Perhaps it is the agricultural researchers, extensionists, and policy makers that need such training!

The second group concludes that it has been donors which have pressured government decision-makers and caused conflicts with IK, particularly in agriculture. At the same time, Western education has adversely affected the IK concept. To preserve a role for IK in Nepal's development, areas best suited to IK have yet to be studied and identified through research. After this, "effort has to be put into development planning so that the best mix of modern and indigenous technologies is found."

CHAPTER 6.
SUMMARY OF FINDINGS, DISCUSSION, CONCLUSIONS,
AND RECOMMENDATIONS

Being an exploration of the *meaning* of indigenous knowledge, this study was wholly naturalistic in intent and involved an attempt to cross the boundary between etic and emic perspectives on indigenous knowledge.

Naturalistic inquiry is interpretive. Whether or not the implications and conclusions drawn appeal to readers depends on their orientation toward the subjects discussed. This author has only very limited personal experience of "other states of consciousness", and is certainly unqualified to represent the realms of knowledge that are appropriately the province of indigenous people. Yet, the author is sufficiently exposed to these phenomena as to acknowledge their reality and their potential relevance to modern agricultural, social, and ecological problems.

However, it is apparent that, just as beauty is in the eyes of the beholder, so too is the meaning that can be attached to indigenous knowledge. For IK appears to be multidimensional. It differs from what is known by means of modern scientific inquiry in terms of the 'level' of what is known, the process of knowing, and the consciousness of the knower. The difference between IK and modern scientific knowledge is that, in addition to 'surface', 'objective' knowledge observable through the senses, even if they are aided by much equipment in modern science, indigenous knowledge, which can be equally 'scientific' in spirit, if not in technique, also admits deeper and more subtle 'visioning' levels of knowing.

Both systems of knowledge share the objective realm, and, at that level, IK and modern scientific knowledge could be regarded as equivalent and interchangeable. Many people, especially, and naturally, those educated in the modern scientific paradigm, would stop at that point. But beyond that point only IK admits the intuitive process of knowing which is understood within the Vedic theoretical framework as *Samhita*. This level of consciousness penetrates behind normally observable detail to an awareness of

energy-matter relationships understood in modern physics as quantum phenomena. This author is convinced by the theoretical and experiential evidence of quantum physics, by indigenous people's testimony about their knowledge and beliefs, by study of Vedic literature, by the responses of Nepali custodians of Vedic culture, and by his own limited 'consciousness' experience, to accept the existence of *Samhita* and what it implies for the meaning of IK and for an enhanced understanding of cosmic order, natural law, and agriculture. It is hoped that the scope of this study may likewise convince others at least that there is 'something else out there' that the mainstream paradigm, despite the evidence from modern physics, has yet to recognize or accommodate.

This study deliberately reviewed a wide breadth of thought and experience on development in the belief that, before IK can be considered philosophically, any researcher should be fully cognizant about the nature and inherent consequences of the mainstream paradigm, the history of revisions attempted about its margin and in its wake, and the equally long history of alternative thought. Such a broad-brush effort clearly risks neglecting the complexity of the discourse in any given subject area. Another researcher might focus attention on a narrower aspect of development to see whether the lessons, i.e. the limits of the mainstream, gleaned from this broader review still apply. A more meticulous study of that kind would have the advantage of being based on a more comparable set of data. One reason that this study did not opt for that approach is personal, having to do with this researcher's professional and academic background, which happens to be broad and inter-disciplinary.

The study of IK discourse attempted here was not 'systematic' in the sense either of being based on some systematic sample of literature or of being analyzed systematically for 'content' as in a survey. As with the review of development literature, the study could have been more narrowly focused on a particular field of IK -- for example, traditional ecological knowledge. Similarly, more specific political or ecological regions, policy areas, or cultural contexts could have been used as a sampling framework. The reason why a narrower or more systematic focus was not taken here was partly in order to mirror the broad review of development literature, and partly because

one of the original intentions of this study was to compile, through a 'call' placed in the CIKARD network, a global bibliography of literature and cases pertaining to the epistemology and cosmology of indigenous knowledge. As that objective met with a nil response (see chapter 4), the bibliographic initiative had to be abandoned although its open-ended approach remained reflected in the 'global' scope of the literature review. However, this literature review was undertaken at a late stage of the research and could not amount to more than a random, and relatively superficial, 'manual' dip into the CIKARD documentation unit which, at the time of this research, was not accessible in an indexed fashion on a data base.

The mainstream-versus-indigenous hypothesis that evolved during the course of this study could be investigated more systematically by analyzing a 'stratified sample' of literature that includes the perspectives of the full range of 'players' involved in the IK project. Firmer conclusions might be drawn, for example, if definitions and terms used for IK, and goals, rationales, and strategies for its implementation, were analyzed in relation to some classification of proponent. That proved beyond the scope of this study, but might have strengthened the analysis. Systematic research of that kind remains a lacuna in the discourse.

The study of Nepal's Vedic tradition was rightfully a substantial research project in itself, to which this investigation hardly does justice. Some of its obvious shortcomings and limitations are discussed in chapter 4. There is no doubt that an ideal study of the subject should involve a substantial period of time of direct observation and, most important, *experience* of the phenomena. This applies especially to the various Vedic rituals and ceremonies and their relationship to the natural phenomena and agricultural practices they are said to influence. The method of study also precluded follow-up questioning, which might have elicited richer description of techniques and practices and explanation of their theoretical and cosmological basis.

Analysis of Vedic texts would have benefitted immeasurably from specialized guidance in that field of literature. Similarly, the study lacked a planned input from scholars of Nepali history and literature which would have provided a sounder

epistemological foundation for understanding the forces that have shaped Vedic culture through history and determined the various sources and influences on current indigenous knowledge practice. Finally, it has been noted already that the study was unable to obtain a policy perspective from Nepal's present political leadership.

Nevertheless, in this study's defense, it should be pointed out that this study was timely. Prior to 1990, when Nepal's authoritarian *Panchayat* regime was overthrown by a revolution, the political climate would have virtually ruled out the possibility of this research. For the restrictions on freedom of expression would have severely constrained or biased responses -- whether of individuals associated with the repressive system, those unassociated with it, or those in opposition to it. That would have made interpretation extremely subjective and the whole exercise, in a sense, pointless. Now that is not the case. There can be confidence in the authenticity of responses and, with greater democratic freedom, there is point to the study of the Vedic tradition because, if its relevance can be re-established, it can be revitalized.

The remainder of this chapter summarizes and interprets the findings of chapters 2,3, and 5. The discussion is organized initially by research objective, followed by a discussion of themes and relationships across objectives. Conclusions are then drawn, and recommendations made, again with respect to each of this study's objectives.

The first objective was to analyze mainstream and alternative development thought and experience establishing the context for indigenous knowledge discourse.

An important finding of this analysis was that there are two fundamentally different paradigms affecting notions of development. The first is the Western, modernity paradigm based primarily on modern scientific cosmology and materialistic, economic, technocratic culture. The second is an alternative, social-ecological paradigm which admits other values, holistic and intuitive ways of knowing, spirituality, and cultural understandings. 'Development' has to date reflected mainly the first paradigm.

It is vital to see 'the IK project', i.e. the contemporary rediscovery and promotion of indigenous knowledge, in terms of an ongoing dialectic between the two paradigms,

and to be cognizant of the historical dominance of the first paradigm, and of what has tended to be only marginal impact of a history of revisions in it. As these were analyzed, this study found that while the mainstream has been forced by the negative consequences of its approach to accommodate, on a rhetorical level at least, certain elements from the alternative paradigm, certain constraints inherent in the mainstream paradigm prevent very great achievement of changes espoused in the revisions. These limits were found to be:

Professionals find it hard to make the cognitive and behavioral jump from paternalistic praxis to authentic participatory dialogue.

Political-economic factors present obstacles to approaches that involve fundamental changes in power relations between social groups.

The scientific mode of understanding imposes cognitive limits on the ability of Western-educated people to understand development issues holistically (basically due to science's reductionism), or to be conscious of wider consequences and meanings. Even inter-disciplinary approaches do not necessarily provide the profoundness of knowledge to guide development with complete insight.

Ethnocentrism remains an obstinate barrier to the admission and acceptance of other cultural interpretations of development goals and processes.

Implicit in the scientific cosmology is a negation of spiritual consciousness and, closely related to that, moral values for guiding the whole development concept.

The resulting mode of development has been crude and insensitive -- socially, culturally, politically, and to other forms of life in the environment. It has turned a blind eye to human rights violation, and has been particularly hostile to indigenous people and other traditional cultures. Western education, including agricultural education, played a key role in promoting the mainstream paradigm and undermining and negating what was indigenous. This educational paradigm still enjoys almost complete hegemony, particularly in the state-controlled curricula of modernizing developing nations.

The dialectic between the two paradigms is inherently conflictual and therefore political. This author has worked with struggle-oriented nongovernment organizations in India and Nepal and knows from personal experience the realities of the struggle of those marginalized by the mainstream: their vulnerability, illness, poverty, sense of hopelessness, harassment, and fear. The murder and imprisonment of colleagues. The

"history of pain". Yet the book *Shadow Over Shangri-La: A Woman's Quest for Freedom in Nepal*, which he co-authored with his wife who was a Prisoner of Conscience in Nepal, is as much about traditional Nepali culture and sacred *Dharma* as it is about the more manifest struggle for political democracy and human rights in that country (203).

That modern agriculture or natural resources management should engender painful political struggle and cultural conflict seems, despite European history of the enclosures, oddly outside contemporary mainstream consciousness. It is as though modern agricultural science and technology, bound to capitalism, became supra-constitutional and beyond reproach -- like an absolute monarch.

But in some respects, driven by foreign advisers, global corporations, international banks, and the interests of corrupt and often illegitimate state and business elites, this is virtually what it was. The centralized, specialized, competitive, exploitative, external-input-driven, industrial agricultural paradigm of the 'First World' was exported lock, stock, and barrel to third world societies. The fundamental human right of traditional peasants and indigenous people to continue to produce a stable, diverse range of agricultural crops corresponding to their cultural preferences was often grossly compromised by the foreign-supported agencies of the state.

Slowly, such facts are becoming recognized as not merely technical, economic, social, or environmental problems, but as political, human rights, cultural, and even spiritual issues. That other cultures might offer *fundamentally* different perspectives on development, however, is scarcely perceived, or *is* realized, but, to use Hobart's term, is "obliterated"(111).

It is vital that the limits of mainstream consciousness are recognized as one essentially hostile and ignorant side of the context for the IK project. The literature surveyed in chapters 2 and 3 makes it plain that this context affects the prospects for IK in exactly the same way that it has limited the impact of previous revisions incorporated by the mainstream.

Equally, however, there is another arena of context for IK, and that is the alternative paradigm which can be constructed from a broad field of phenomena occurring

outside the mainstream. This alternative paradigm was found to involve the following key elements:

A humanist-social reconstructionist professionalism that is prepared to tackle the gaps between its espoused theories and theories-in-use that previously produced paternalistic biases, and to embrace a pedagogy that encourages the emergence of consciousness and self-determination among previously marginalized groups.

New political-economic and legal formations that empower and safeguard human rights and alternative economic systems.

Enhanced, more holistic understanding of social and ecological problems, and recognition of intuitive realms of knowledge.

An enhanced view of traditional culture as a vital ingredient for authentic development, and of its inherent relationship to nature in any locality.

Revival of spirituality, moral values, and reverence for the Earth leading to enhanced conceptions of sustainability.

These elements have profound implications for agriculture, virtually reversing the set of premises that have formed the mainstay of conventional agriculture. The two paradigms -- conventional and alternative -- are so different that many scholars claim that alternative agriculture has to be reconstructed from alternative science and alternative values, a task that only new actors can possibly accomplish. Reform, they say, cannot be accomplished by a little tinkering around the edges.

Implications: The main implication of this investigation into mainstream and alternative thought is that the two paradigms present both a fundamental philosophical choice, and a supreme challenge, for the IK project. Essentially, the question is: In which camp should the IK project belong?

The findings of this survey of development literature imply that if the IK project is controlled by the agencies and normal professionals of the mainstream, it is likely to be implemented as a revision within the mainstream with, as far as possible, the objective of perpetuating mainstream values and norms under the guise of 'sustainable development'. In contrast, if the IK project is controlled by the alliances and networks of the alternative movement, it may be implemented with fundamentally different goals and values in mind.

Ultimately, though, the challenge of the IK project is to explore ways in which the

strengths of indigenous knowledge can counteract the limits of the mainstream based on modern scientific cosmology, and vice versa. From this premise, the complete context for IK discourse includes spiritual, moral, cultural, cognitive, political-economic and human rights, and participatory considerations. Philosophically, this implies moving beyond political realism to social reconstructionism, pragmatism, and the idealistic realm of morality and spiritual consciousness.

In other words, the ultimate challenge of the IK project is to change the mainstream calculus by admitting alternative cosmologies. There are some signs that the climate for such a change is becoming more favorable as the mainstream is forced to accommodate as revisions increasingly fundamental changes -- for example, conservation of biological, and with it, cultural, diversity, which requires quite radical shifts in ethics and values.

The second objective of this research was to analyze trends in indigenous knowledge discourse, and to find out the meaning and relevance of IK as articulated by advocates and custodians of these knowledge systems.

This objective was pursued by analyzing the various goals and rationales put forward by advocates of the IK project, along with the terminology, definitions, and characterizations used to describe indigenous knowledge, and comparing these with perspectives on their knowledge of indigenous people themselves.

The key findings of this chapter are summarized in the following paragraphs.

Historically, IK has been undermined and destroyed by the combination of conscious "obliviation" and unconscious ignorance of modern scientific cosmology.

Goals and rationales for the IK project fully span the continuum from development revisionism to alternativism, and address every conceivable limit of mainstream development.

The dominant mode of 'operationalizing' IK seeks to incorporate elements of IK systems -- indigenous communication channels, indigenous organizations, indigenous innovation and experimentation, indigenous decision-making, or IK practices -- into development activities. Problems requiring more holistic understanding, e.g. biodiversity

conservation involving social-ecological approaches, are incorporating more of the 'totality' of IK.

Terminology used for IK tends to reflect dimensions of IK people are interested in. These interests may limit the perspective on IK to one that incorporates less than its holistic totality, and may divert attention away from indigenous cosmology and from perspectives allied with indigenous movements. The greatest difficulty of Western-educated observers of IK is to acknowledge the possibility of other ways of knowing.

Despite this difficulty, there is a general consensus among scholars and practitioners working with indigenous knowledge that IK can be distinguished from modern scientifically-based knowledge by its moral, spiritual, intuitive, and holistic character; by its distinct cosmology, or world view; and by its inseparable identification with nature. However, the only Western scholars to define IK by reference to these distinguishing characteristics appear to be those concerned with traditional social-ecological knowledge.

This social-ecological characterization and definition of IK appears to be the one that conforms most closely with indigenous people's perspectives. Key elements of the indigenous perspective involve: a custodial, anti-consumptive world view; a strong sense of belonging to and veneration of the natural world, all elements of which are respected as living entities; a holistic vision of life in compliance with natural law as the basis for agriculture -- which should enhance and enliven nature, and whose role is to coordinate harmony, wellbeing, and equilibrium among all components of the cosmos; the understanding that knowledge of the environment depends on contact with the invisible spiritual world whose essences and powers -- nature's organizing principles, or natural law -- constitute the true nature of objects in the natural world; belief in quest for harmony between individuals, society, the spirit world, and nature; and the practice of sacred rites and ceremonies to influence surrounding environmental and cosmic forces in order to favor agricultural and other activities.

In every indigenous culture that has not yet been destroyed by modernizing influences, specialists can be found who still possess the knowledge of traditional rites,

ceremonies, and techniques of consciousness that have enabled such cultures to keep alive their traditional connectedness with natural law, and which serve as ethical guidelines for human social relations and relations with nature.

Many indigenous cultures recognize subtle levels of energy flow within plants and between plants, their ecosystem, and cosmic influences. They recognize also that certain plant and food ingredients contain or express such subtle energies, which are understood as divine forces, and that quality, goodness, or purity of foods, just like herbal remedies in traditional medicine, can be explained in these terms.

Implications: A number of implications follow from this study of indigenous knowledge discourse. The most significant implication concerns understanding and definition of IK. There appears to be consensus even among Western observers that IK systems are holistic systems of knowledge pertaining to natural phenomena that are passed down over many generations, and that are embedded within nature-regarding cosmologies in which sacred and religious beliefs play an essential role. Indigenous people themselves reveal explicitly that indigenous knowledge is essentially *sacred knowledge*, or knowledge of universal natural law as expressed in local forces of nature. If, from an emic, indigenous perspective, this sacred knowledge is the essence of IK and is what characterizes and is distinctive about IK, then this essence can and should be incorporated into any universal understanding or definition of IK.

Indigenous knowledge may thus be *defined* as the sacred knowledge of indigenous people, understood as cultures that have evolved over many generations in a particular natural environment and that maintain, through spiritual practices, consciousness of universal natural law as it is expressed in local forces of nature.

Based on revealed knowledge of natural law, indigenous knowledge thus includes:
Clear and certain perception of the cosmic and sacred realm of being.

Knowledge of rituals and skill in practices for enhancing consciousness in this realm.

A vast, and constantly accumulating, body of knowledge about the relationship

between humankind and nature -- *life world knowledge* -- specific to the natural environment where the culture is indigenous.

Indigenous knowledge is thus, by definition, *traditional*, and dependent for its maintenance on the expertise of specialists in rituals and practices for communing with the sacred realm. Even if the 'body of knowledge' grows through farmers' trial and error learning and experimentation, those processes of knowing still take place embedded in the sacred cosmology, and the known is inextricably tied to that cosmology and inseparable from it.

The inseparability of the cosmic and sacred dimension from the manifest level of indigenous knowledge is what distinguishes indigenous knowledge from the objectivity of modern science, and is the defining characteristic of indigenous knowledge.

Several fundamental implications follow from defining IK as sacred knowledge. The main implication is that, following the example of holistic understandings of traditional medicine, such an understanding of IK leads to a profoundly different and enhanced perspective on indigenous agriculture, which is seen to involve fine understanding of the subtle qualities of food and herbal products essential to health and wellbeing, and of production methods that preserve harmony with the environment.

Further, this definition alerts Western-educated observers, when studying indigenous environmental and agricultural knowledge, to be mindful of the importance indigenous people attach to their knowledge and understanding of invisible spiritual essences and powers underlying 'observed reality', and to be open to the possibility that this indigenous understanding may profoundly and valuably influence attitudes and practices.

Another implication is that the greater the 'purity' of a culture's indigenous knowledge, the more powerful the knowledge may be as a potential tool for harmonizing that culture's relationship with nature.

It follows that, if development activities are to be authentically based on indigenous knowledge, with outside knowledge from modern science playing a supporting role, specialists in traditional theoretical knowledge who maintain the traditions of

enhanced awareness should be sought out to play a guiding role throughout all stages of program development.

In this way, with IK 'strong', only life-supporting innovations that enhance nature's abundance and the local culture's traditional harmony with natural law will be incorporated into the traditional knowledge base.

This emic conception of the relationship between modern scientific knowledge and indigenous knowledge *reverses* the approach of incorporating IK components *into* development. The emic conception is only tenable if the possibility is accepted that 'pure IK' exists. The literature surveyed here implies strongly that 'pure IK' does exist, defined from the indigenous perspective as above, and understood most readily within the Western scientific framework through the discovery by modern physics of the quantum field. It is an idealistic perspective, but evidence is mounting that it is also the wisest pragmatic choice for prosperity, wellbeing, and balance of humankind and all other life forms on Earth.

The challenges for the IK project implied by this emic conception are truly fundamental. As implied in the conclusion of chapter 2, the ultimate challenge is to admit other cosmologies into the Western cultural mainstream in order to reverse its basic calculus toward one that uses modern scientific knowledge to serve rather than to guide and control development. Currently, the mainstream would continue to control, using IK as guide only to more resources to exploit, rather than as a guide to what to do with them and how to share them.

Mainstream incorporation of IK runs two risks or sins of omission. One is that, by incorporating components of indigenous knowledge, IK becomes reduced to a fragmented collection of techniques abstracted from its underlying traditional theoretical knowledge base. The other is that incorporation may miss the essence and most subtle, enlivening field of indigenous knowledge -- its cosmology, or understanding of natural phenomena. If, after so much global destruction, the final act of the modern scientific paradigm is to emasculate this deepest level of IK by incorporating only the surface knowledge that can be assimilated into the dominant paradigm without changing it, that would represent an

ultimate human catastrophe. For, if this deepest level of pure knowledge exists, it is, as Mazur commented, the key to its operationalization (165).

A final implication from studying the IK discourse relates to indigenous control of the IK project. Given that the paradigmatic context, and the reversal implied above, involve questions of power relations between cultures and knowledge systems (modern versus indigenous), the recovery and promotion of IK is fundamentally a political process over which indigenous people and custodians of pure IK understandably demand control. For anti-paternalistic, political and human rights, cognitive, cultural, and moral-spiritual reasons, this implies that the IK project be conceptualized as a movement.

This study's **third objective** was to discover how the cosmology and sacred beliefs of the Vedic tradition are interpreted and applied in the context of modern development, particularly in agriculture, in Nepal. Before discussing implications of this investigation's findings, the findings themselves are summarized -- firstly, the review of Nepali and Vedic literature, followed by a summary of the interview responses.

Firstly, it was found that Nepal is a multi-ethnic society with at least seventeen language groups, all of which adhere in the main to Hindu cultural norms enshrined in the Kingdom's constitution. Hindu customary law established in *Manusmriti* forms the basis of the law of the land. Although the kingdom was isolated from the outside world by an oligarchical regime for over a century until 1950, Nepal was never colonized. As a result, Hindu *Dharma* was little disturbed until modern development was introduced to a limited extent in the 1950s, and to a much greater extent, accompanied by tourism, from the 1960s. The three main decades of Nepal's modern development, the 1960s, 1970s, and 1980s, were overseen by a repressive, authoritarian regime, and the experience of development was characterized by human rights abuse; rampant economic corruption; political and administrative centralization; massive, unregulated urban growth and pollution especially in the capital, Kathmandu; environmental destruction, particularly of former national and community forests; deepening poverty; and mounting social and political strife. Despite continuous foreign aid for agriculture, especially the heavily-

populated hill districts experienced growing food deficits and worsening nutritional status.

Whether Nepalis realize it or not, Vedic culture, with its extensive branches of knowledge in the Vedic texts, is the root and 'pure tradition' of Hindu and Buddhist *Dharma*. Although rituals derived from the Vedic tradition have been consistently practiced over the centuries, and remain so today, the vitality of the pure tradition in the Nepali consciousness steadily eroded after the caste system became rigidly institutionalized in a distorted interpretation of Vedic *Dharma*.

Vedic culture evolved at least 6-8,000 years ago, and was an oral tradition whose knowledge and cosmological insights visioned by holy seers were subsequently encoded in a very precise language, Sanskrit, whose sounds and structure are understood to reflect the literal essences, elements, and regulations of cosmic phenomena -- the laws of the universe and ultimate forces of harmony in nature.

The Vedic texts are essentially a collection of hymns, prayers, chants, and *mantras*, supplemented by interpretive and instructive texts, which communicate the sacred knowledge of cosmic order visioned by the seers. The *mantras* personify every element of the universe as deities, or living beings, and the hymns, prayers, chants, and prescribed sacrifices are said to contain specific formulae for influencing them in order to produce desired effects on any aspect of human existence in the natural world.

These basic cosmological texts were elaborated and further articulated by a whole series of scientific texts with observed and experimentally-based as well as visioned insights into diverse branches of learning covering everything from astronomy and astrology, to medicine, agriculture, silviculture, law, and government.

Central to the Vedic tradition are assumptions of spiritual and religious life and harmony with cosmic order. Thus, a basic principle in Vedic cosmology is understanding of human consciousness (*atman* or *chetana*) and its relationship to the forces of nature which are understood as cosmic consciousness, or *Brahman*. This understanding reaches beyond the theoretical or philosophical realm, and is operationalized through various techniques and rituals. One state of consciousness so produced is *Samhita* -- the collectedness of "known", "knower", and "process of knowing". Vedic science offers

perspectives on the purpose of agriculture which differ profoundly from those of modern agricultural science. Essentially, through attaining higher states of consciousness, the farmer is capable of *enlivening*, not subjugating, nature.

Vedic rituals became institutionalized in Hindu *Dharma* and, even if unaware of their antiquity, are now followed routinely by virtually all Nepalis. Constant practice of Vedic meditation and sacred rituals, many of which are performed in synchrony with astrological calculations, is understood to enhance consciousness and enable physiological and mental functioning on more subtle levels in closer accord with the elements and energies in the unseen world.

The original insights of Vedic seers are understood to be 'pure' sacred knowledge obtained through devotion, meditation, and contemplation when inspired to have right understanding by prayer and surrender to God. The methods of experiencing this realm of pure knowledge are as available today as they were six thousand years ago.

The Vedic tradition's greatest emphasis in culture is the concept of *ṛta* -- supreme harmony or cosmic order. *Ṛta* extends to human relations with every element of the universe and nature. Vedic agriculture cannot be studied in isolation from the *ṛta* concept or from the embodiment of elemental forces in *mantras*. Thus, the primary concern of Vedic agriculture is to attune with nature through the consciousness of the farmer. In a Vedic, inspirational view of agriculture, nature is worshipped as the source of life -- the Mother Goddess -- and is courted by the sublime music of *gandhaarvas*. The meaning of agriculture is to understand the subtle forces and essences of nature, to invoke their cooperation by personifying them as deities and performing sacred ceremonies, and to predict their pattern through the scientific art of astrology and observation of natural signs.

Vedic theory also sees agriculture, through its production of food and herbs, as inseparable from a greatly expanded view of health as elaborated in *Ayurveda*, the science of life. In *Ayurveda*, the starting point to health is seen as spiritual harmony which is reflected in physiological balance, and which can be influenced by close attention to the quality and subtleties of foods and herbal preparations seasonally, and at different times

of each day.

Vedic farming therefore involves a highly complex, diverse, integrated farming system involving medicinal herbs, a great and constantly changing variety of seasonal food crops, vegetables, fruits, and plants with sacred ceremonial and other uses. Animals, especially cows, were also kept in Vedic times for draft power, milk, and manure.

Respondents to this study's interview questions reflected a range of Nepali opinion on the meaning and relevance of the Vedic tradition in Nepal today. For the purposes of this discussion, their responses may be organized in relation to the following issues: the nature of Vedic knowledge; the meaning of development; awareness and current practice of Vedic knowledge in Nepal, including consideration of factors inhibiting its practice; the respective roles of Vedic and modern scientific knowledge in Nepal's development; and perception of the importance of Vedic knowledge and the relevance of *Ayurveda* in Nepali agriculture.

On the nature of Vedic knowledge, as expected, Vedic pandits and priests were most informative. Pandits emphasized that Vedic knowledge is not 'traditional' in the sense of being static and incapable of change. On the contrary, Vedic knowledge is explicitly progressive in the sense of recognizing human capacity to understand and be attuned with the universe. The Vedic concept of progress is increasing human prosperity by enhancing consciousness. Priests were equally conscious of their role in prescribing rites for people to perform which remind them of their relationship to all other living beings. Ayurvedic physicians expressed the Vedic view that failure to maintain *rita*, or balance among natural and cosmic forces understood as gods and goddesses, is a basic cause of health imbalance.

Pandits were very clear that the Vedic understanding of development is about consciousness. Further, development should be for all living beings on earth, and for the Earth itself, as much as it should be for human benefit. Progress is also intimately related to societal consciousness and performance of social *dharma*, and to consciousness of national leadership. Development in Nepal will not occur when leaders neglect Vedic

Dharma by lapsing into corruption and alcoholism.

All groups of respondents except farmers were conscious of the erosion of Vedic knowledge in Nepali society, and proposed similar explanations. Pandits traced the destruction of Vedic knowledge in the subcontinent as a whole to the Muslim invasions. Western educational influence then took over as the main destructive force from the time of the 'Christian invasion' of British colonialism. Pandits, priests, Ayurvedic physicians, and agricultural professionals all perceived that the Western-influenced Nepali curriculum and the Western education overseas of Nepali professionals and technicians had produced a generation of Nepali decision-makers who are ignorant of their Vedic tradition and therefore fail to see its relevance and encourage its use in development.

Astrologers and Ayurvedic physicians, representing two branches of Vedic knowledge, were particularly emphatic about government leaders being unaware of the role of their specialized professions in national development. Agricultural professionals, while not advocating the relevance of Vedic knowledge, were nonetheless equally conscious of the influence of Western education -- having been through the Western system themselves, either under Nepal's New Education System Plan or overseas, and thus falling in the 'ignorant' category. They also attributed the inhibition of Vedic knowledge to pressure from foreign aid agencies in favor of the transfer of technology model of development.

Farmers appeared completely unconscious of the issue of destruction of Vedic tradition. Either this reflects the perception of one agricultural professional who wrote that farmers are "wise enough to ignore" harmful external influences on their tried and tested traditional practices. Or it reflects what several categories of respondents perceived as ritualistic performance of the traditions, unconscious of their Vedic origin. Generally, farmers, even Brahmin farmers, appeared to have no knowledge of the Vedic tradition as such, or of its history. Judging from their comments, it seems that this low level of awareness reflects confusion in ordinary Nepalis' minds between the Vedic tradition and caste Hindu *Dharma* introduced later.

Pandits bemoaned that the Vedic tradition in Nepal today is generally performed

without true understanding, i.e. consciousness -- from the level of the royal priests to the ordinary Brahmin. This state of affairs is attributed to materialism and foreign, secular influences. Priests seconded this perception, observing that Nepalis are neglecting their social and environmental *dharma* which sees the presence of God everywhere, substituting *rita* with regulations that benefit only human populations. The influence of Western education has led to *adharmic* practices. The priesthood has been undermined, purity of Vedic knowledge is being lost, and misconduct is everywhere to be seen. In this regard priests equated the neglect of *mantras* and meditation and the consumption of "bad food" (*tamasic* and *rajasic* food which respectively dulls the senses or enlivens passion, as opposed to *sattvic* food whose essence is purity) with corruption. Pandits expressed a similar view. Consciousness is needed in Nepali society from the level of rulers to the level of the ordinary farmer whose consciousness forms the basis of harmony with nature and therefore of successful farming. Agricultural professionals, however, considered meditation "too complicated" for farmers, although they did not rule it out as valuable for themselves.

Regarding the role of Vedic knowledge in Nepali development, opinions of respondents varied widely. Essentially, specialists in Vedic knowledge regarded their province of specialized knowledge as highly relevant and, indeed, properly the *basis* of Nepali development. Farmers and agricultural professionals were less clear about its relevance.

Pandits and priests view the Vedic tradition as the basis for Nepali development, although 'liberal' pandits emphasize that the Vedic tradition should be interpreted in the liberal spirit in which it was originally revealed. This is a clear reference to avoiding confusing the original pure tradition with later caste influence which, if allowed to taint a Vedic revival, would alienate a significant segment of the Nepali population. Therefore pandits recommend the revival of the Vedic tradition in Nepal in its 'pure' form which expresses simply the proper relation of human beings among themselves and with their universe. They go further to echo the sentiment of indigenous people elsewhere that the following of their indigenous (i.e. Vedic) tradition should be *strengthened* so that the

Nepali nation has the wisdom to discriminate with respect to the kinds of foreign knowledge and technologies that should enter Nepal. Specifically, as guide to the synthesis of Vedic and modern scientific knowledge, pandits state that only aspects of Western knowledge that "coexist with the Vedic tradition" should be imported. This can be understood to mean technologies which enhance, rather than disturb, the *rta* concept of harmony in society, nature, and the universe. In this respect, priests believe that it is still possible for Vedic consciousness and spirituality to be revitalized in Nepal, and that this is essential for progress in Nepali society.

As already mentioned, Vedic specialists were specific about the relevance of their branches of Vedic knowledge in Nepal's development. Pandits pointed out that Ayurvedic knowledge could be drawn upon in the development of a sound, natural population policy founded upon herbal use and traditional moral restraint. They also supported Ayurvedic physicians' claims that Ayurveda should be restored to a position of importance in national policy. Currently, there is minimal reference to Ayurveda in the nation's agricultural plans, but Ayurvedic experts believe there is great potential for expanding the program of medicinal herb production and Ayurvedic industries in Nepal. Part of this effort should involve curriculum change and the expansion of Ayurvedic education in order to produce more experts knowledgeable in Ayurvedic medicine to staff a national health system that can reach and benefit all Nepalis, and which would have further implications for local production of medicinal herbs and food items required in an Ayurvedic diet.

Astrologers were equally emphatic that Nepali government leaders should be aware of the role of astrology in administration, and that knowledgeable astrologers should be included as experts in national planning, meteorological forecasting, and as advisers to government institutions and programs.

Farmers and agricultural professionals, although aware of ritual Hindu *Dharma*, admitted to ignorance of Vedic knowledge as such, and could not therefore be expected to see its modern relevance. However, there were farmers who, when the original Vedic tradition was explained to them, agreed that its revival in Nepal would be good if it

would reduce the discrimination of the caste system.

Notwithstanding farmer ignorance of the Vedic tradition as such, this study found that farmer practice of religious rituals originating in the Vedic period is universal. Pandits explained that, according to Vedic understanding, agriculture is the main expression of human knowledge of living on earth, for which farmer consciousness is the key. Priests and agricultural professionals alike confirmed that farmers perform religious rituals at each and every step of farming in Nepal, from influencing rainfall, to sowing, crop protection, harvesting, and storage. Naturally, priests expressed the belief that the *mantras* of the *Karmakanda* have significant bearing on agriculture, as they suggest or prescribe the kinds of food that families should produce in order to maintain good health, methods of worshipping deities which influence outcomes of agricultural activities, methods of enhancing soil fertility, *yagya* ceremonies to influence rainfall patterns, and ways to preserve forests and pastures. Priests and astrologers may cooperate in analyzing why farmers are not experiencing success, after which priests can prescribe specific *yagyas* to modify or avert negative astrological influences. Astrologers explained that farmers may not recognize the role of astrology explicitly, yet most farmers follow practices that intuitively adhere to astrological guidelines.

According to Western-educated Nepali agricultural professionals, performance of religious rituals does not have a significant effect on agriculture. The role priests and rituals play is "just a tradition". Evidence from farmers' responses seems to confirm this perception. While the performance of what are essentially Vedic rituals is universal among Nepali farmers of all ethnic groups, *consciousness* of any deeper significance of the rituals appears limited.

Nevertheless, Nepali farming systems still resemble closely the highly integrated, biologically diverse systems of the Vedic period. The knowledge of *rta* around which these systems presumably originally evolved has perhaps now become ingrained and intuitive. Likewise, some Ayurvedic knowledge is universal. Every farmer appears to have some knowledge of the role of medicinal herbs and seasonally appropriate foods in human health, and complain about the government's neglect of potential medicinal herb-

based industries.

Some farmers are conscious of the desirability of maintaining the natural fertility of soil, and express a preference for restoring a more ideal balance of livestock and plants in their farming system. There is some awareness of the need for environmental conservation, of damage chemical fertilizers may do to the soil, and of the superiority of local implements. Agricultural professionals, in particular, were conscious that sole reliance on modern agricultural science and technology was unsustainable. However, such 'indigenous orientation' appears, subjectively, to be tending to become eclipsed by the message of agricultural modernization being proclaimed over the government media and by field staff. The majority of farmers respond to questions about improving agriculture with demands for more modern inputs, chemical fertilizer, depots, stores, other modern rural infrastructure, technical services, training, and financial loans -- all to be provided by the central government. They also demand the expansion of irrigation, which may not necessarily conflict with *rta*, especially if based on local knowledge and resources.

These perceptions of farmers are not surprising given their experience, especially in the hills, of meager livelihoods, food deficits, and poor nutrition, and the non-articulation by any source of an indigenous alternative. However, among agricultural professionals awareness of IK and the value of incorporating it into research, is growing.

Implications: The findings of this study hold several implications for the role of the Vedic tradition in Nepali agriculture and development. Firstly, Nepali specialists in Vedic knowledge interpret the Vedic texts as still providing vital principles and insights relevant to modern development, including agriculture. However, a gulf exists between custodians' perceptions and those of Western-trained Nepali agriculturalists and policy-makers who neglect their traditions. Ordinary farmers appear essentially caught in between, and, as in most of the rest of the world, are being influenced away from their indigenous knowledge by agents of the conventional modern paradigm.

All players involved in contemporary Nepali agriculture recognize that an appropriate mix of IK and modern agricultural science and technology might be optimal.

However, there is a difference of opinion as to which knowledge system should form the basis. Agricultural professionals have little understanding of Vedic cosmology, although they see wisdom in indigenous agricultural practices, and support the idea of incorporating such practices into modern agricultural development to make it more sustainable. Custodians see modern science and technology as dangerous in the absence of guidance from the Vedic *rta* framework. To them, Vedic wisdom should form the basis.

The reason why Vedic specialists advocate Veda as the basis of Nepali agriculture and development is that they believe that agriculture, and every realm of human development, should reflect wider social *dharma* and consciousness of *rta*. To Vedic pandits, a holistic world view means implementing Vedic *dharma* in totality. Enhanced human consciousness, understanding, and conduct are the prerequisite in every field of development.

Nepali specialists confirmed the view of literature on that tradition that Vedic knowledge offers a profoundly different concept of agriculture than modern science. What is implied by this different conception is that the result of incorporating isolated indigenous practices into mainstream agricultural development, in the absence of thoroughgoing ethnoscientific investigation which probes into IK cosmology, may be different from the result of beginning the agricultural development process from a basis in Vedic knowledge. One process would tend to be based on Western scientific understandings. The other would be based on a Vedic theoretical framework. The notion that there may be a common 'midpoint' that would be reached no matter which starting point -- IK or modern scientific knowledge -- was used, may be a misconception.

As a result, to bridge the gap separating agricultural professionals and pandits and other Vedic custodians requires more than political or ideological negotiation. In a word, it requires identical *consciousness*, and the use by agricultural professionals of rigorous ethnoscientific techniques which would be equivalent to starting from IK, or ethnoscience -- in this case, the Vedic tradition. One agricultural professional commented that although revival of Vedic meditation might appear too religious and complicated for the average farmer, such a revival might not be out of place for professionals. This is an interesting

comment, for it appears to express a recognition that many Nepali professionals and policy-makers would be able to provide better leadership in their society if they returned to practicing traditional Vedic *Dharma*.

The view that meditation is too religious and complicated for farmers could be interpreted in either of two ways. One interpretation is that it is not necessary for every farmer to practice meditation so long as some members of each community -- traditionally a Brahmin *janne* (elder, or "knowledgeable one") -- maintained the Vedic traditions and could advise others. However, pandits would say that that is not enough and that ideally there should be one *brahmachari* (celibate person) maintaining Vedic traditions in every *family*. Another interpretation is that the agricultural professional who made this comment is unaware of how simple basic Vedic meditation is.

Other implications of the chapter 5 findings can be listed more briefly. They include:

The need for fundamental curriculum change throughout the Nepali education system to reintroduce Sanskrit and Vedic education. The objective would be to revive Vedic consciousness in Nepali society and to produce future generations of Vedic specialists, particularly in branches of knowledge such as Ayurveda, *Jyotish* (astrology), and Sthapatya Veda (for spatial planning). These specialists would be valuable both for Nepal's own internal needs, and for 'export' of such knowledge to other countries.

A close relationship between agriculture and the provision of the dietary and herbal ingredients for a national health system in Nepal based on Ayurveda.

A role for Vedic *Jyotish* in national planning.

A need for pandits and priests to revitalize and reinterpret the Vedic tradition for the needs of contemporary Nepali society.

The need to investigate the reported trend that Brahmin varna farmers are adopting modern technology at a faster rate than other Nepali social groups, and the implication this carries for loss of Vedic knowledge in Nepali society.

Extension implications that follow from this trend.

A need to provide orientation in the totality of the Vedic tradition to all foreign technical assistance personnel in Nepal.

Finally, there are political implications. Recent history has been very destructive towards Nepal's Vedic tradition. Western influence was imposed through an authoritarian

rule which was unaccountable to the Nepali people. During that period there was no coordination between indigenous knowledge, national plans, and farmer priorities. However, despite the legacy of environmental and knowledge destruction after the three decades of authoritarian rule, almost all ordinary Nepali families maintain the ritual aspects of the Vedic tradition. As strong remnants of the tradition remain, there is still a chance to revive agriculture, health, and other aspects of Nepali development through this tradition. The branches are there, somewhat withered, and only the root needs watering.

The return of democracy makes this easier. Pandits and other specialists can organize, politically if necessary, to defend their knowledge system, reassert its relevance, and press for curriculum reform. If handled carefully, the revival of Vedic knowledge need not antagonize any Nepali ethnic or religious minority. For the principle of Vedic culture is *rta* -- a timeless, non-discriminatory concept. The concept is enshrined in the Nepali constitution in terms of *kuldharmā*, the fundamental right of every Nepali subculture to maintain its own religious and social tradition within the very broad framework of Hindu law. Therefore, even if certain ethnic groups pre-date the majority caste Hindu Nepali population, their indigenous knowledge, by definition, will be respected within the Vedic framework.

Nepal may be rare in today's world in being a country whose religious, cultural, constitutional, and legal norms all still consistently reflect the country's indigenous knowledge system. Only politically, socially, and economically did Nepal recently go 'astray' -- in response to the Western development paradigm -- creating the legacy of a 'gap' between the country's professionals and the *Dharma*. The responses of this study indicate that, except for some Western-trained Nepalis, there may be wide consensus among Nepalis in favor of revitalizing the Vedic tradition as a general cosmology and knowledge system for guiding all aspects of Nepali development. This would be a framework for Nepali development to which all Nepalis could relate. Its emic categories would make sense to Nepali farmers. It would save and enliven the uniquely Nepali part of global cultural diversity and enlarge total human understanding.

The fourth objective of this research study was to determine the implications of Nepal's Vedic indigenous knowledge tradition for agricultural education in Nepal.

The previous section summarized this study's findings about how the Vedic tradition is interpreted, especially in relation to agriculture, in Nepal. In a nutshell, the Vedic tradition offers a very different perspective on agriculture to that which has been introduced over the past three decades of modern development in Nepal. Vedic knowledge provides a different view of the purpose, methods, and organization of agriculture, the nature of agricultural knowledge and inputs, the quality of agricultural produce (outputs), and the relationship of agriculture to other social and economic 'sectors'. It follows that incorporating the totality of Vedic knowledge into agricultural and educational policy would have radical implications for the objectives, learning experiences, organization, and evaluation of agricultural curriculum in schools, colleges, extension, and non-formal educational settings in Nepal. The implications would be radical because they would dramatically affect the curriculum that has been set in place over the last two to three decades.

Educational planning since the 1960s, and especially since Nepal's New Educational System Plan introduced between 1971-75, has consistently adhered to a conventional, modernizing model. At that time, all education became centralized under a national curriculum set by the *Panchayat* government, with all primary to secondary education the responsibility of the Ministry of Education and Culture, and all higher education, including agricultural education, centralized under Nepal's only university, Tribhuvan University.

As was described in chapter 5, over this period the policies and programs for agricultural development became the province of a highly centralized megastructure of government departments and parastatal organizations. More particularly, it became the province of a new cadre of staff trained in the Western agricultural science paradigm. Secondary school students who completed 400 marks of vocational subjects (Agronomy, Horticulture, Poultry Science, and Animal Husbandry) were recruited as Junior Technical Assistants (JTAs) -- the government's basic-level field worker. Alternatively, secondary

school leavers could become JTAs by completing the first year of the 2-year Certificate course in Agriculture or Animal Science at one of Tribhuvan University's four agricultural campuses or training centers. Those completing the second year of the Certificate program at Rampur campus qualified as Junior Technicians (the next staff grade up). To become a District Agricultural Development Officer involved completing the 3-year B.Sc. Diploma in Agriculture. All degree training higher than this was obtained outside the country -- mainly in India or the United States, and to a lesser extent in the United Kingdom, the Philippines and elsewhere.

The emphasis of Nepal's agricultural development curriculum and educational planning has been wholly to staff its burgeoning agricultural agencies with personnel capable of implementing the Green Revolution agricultural paradigm whose progress was evaluated in terms of targeted area 'covered' by improved variety seeds, sales of improved seeds, chemical fertilizers, pesticides, and modern implements, and disbursement of agricultural credit.

As discussed above, the Vedic tradition offers a totally different conception of agriculture that embodies all the elements of the alternative agricultural paradigm (Appendix II). In particular, in the Nepal context, Vedic knowledge would encourage optimal diversity, with farmers in each micro-agro-ecological zone pursuing a farming system perfectly corresponding to local natural law. The mix of agricultural enterprises would be oriented primarily toward local self-sufficiency, and guided especially by Ayurvedic principles relating health and wellbeing of local cultures (and their livestock) to the particularities of the local environment, season, and climate. These principles would influence selection of plant species and varieties of crops, emphasizing different criteria than 'maximum yield under higher external-input conditions'. Criteria would be related primarily through the *rta* concept to the total wellbeing of human and other populations and the environment.

To the extent possible and acceptable, *sattvik* varieties would be encouraged regardless of local *varna*. Beyond that, species and varieties would be selected that provide specific herbal products and qualities of diet required for health of the local

culture as defined by its *varna* characteristics. For example, according to Ayurveda, the blacksmith *varna*, who deal with certain metals and undertake specific activities relating to their profession, would be prescribed a differently balanced diet (irrespective of season) of food and herbs than a tailor, a Brahmin farmer/elder, or a *Kshatriya* leader -- who might need a more *Pitta*-dominated diet to aggressively defend social *Dharma*. The rationale for dietary variations illustrate the significance of IK cosmology. There are reasons why different cultures evolve traditional diets. Different "eating practices" are not merely of archival interest.

Basing Nepalese agriculture on Vedic knowledge would also have a profound impact on her choice of agroindustries and exports. Under *Panchayat* government, tobacco production for a cigarette factory and production of alcoholic beverages featured prominently as Nepal's agro-enterprises. Public policy grounded in a Vedic framework would strongly discourage such public ventures, and would promote instead holistic agro-industrial ventures such as Ayurvedic industries, organic food produce, and production of high-value *sattvik* varieties and pure genetic material for export. Another 'export' could be technical expertise and consulting services in applied branches of Vedic science, for example in *Jyotish*, Ayurveda, and spatial planning -- Vedic architecture, farm, town, and regional planning.

To revitalize these traditions would involve re-incorporating Vedic knowledge into Nepal's agricultural and other educational curricula. The importance of making this kind of philosophical choice in education planning is emphasized by Bodeker in the context of reviving traditional medical knowledge. He writes (38,p.1):

It is perhaps a truism to state that underlying every exercise of educational planning is a set of assumptions about the nature and goals of education... but in the absence of a clear statement of the underlying philosophy reflected in policy, unintended consequences can result.

Shaull, in his introduction to Freire's *Pedagogy of the Oppressed*, writes that there is no such thing as a neutral educational process. Education is either an instrument to facilitate integration of the next generation into the logic of the present system in conformity with it, or it is the practice of freedom to deal critically and creatively with

reality and discover how to transform the world (240).

The model of agricultural education and extension that has been guiding Nepal's agricultural development for three decades is rooted primarily in American educational philosophy and experience. Nepal's government agricultural infrastructure has been structured to perpetuate the modern science-based 'transfer of technology' research and extension model of agricultural development. Now, as Jules Pretty commented recently (211), the great challenge is to re-educate scientists and get normal agricultural research and extension to deal operationally with multiple perspectives which, in Nepal's case, includes indigenous perspectives rooted in the Vedic tradition. The basic educational goal of curriculum reform should therefore be to re-educate Nepal's few thousand (as the pandits would put it, "brainwashed") agricultural professionals and re-build an agricultural workforce that understands Vedic culture.

To reform the agricultural curriculum would clearly constitute a major philosophical, political, and organizational task involving a wide range of contributions. These would include those of: farmers of all varnas and ethnic groups; specialists in all relevant branches of Vedic knowledge; people with knowledge of alternative agricultural science from external sources (e.g. permaculture and sustainable agriculture, which are both represented by nongovernment organizations in Nepal); as well as conventional agricultural scientists. There are also tremendous human resources and experience of alternative agriculture in India, especially in the nongovernmental sector. To begin with, until research activity into Nepal's indigenous knowledge has begun yielding planning data, intuitive judgements of Vedic specialists would play a dominant role in establishing the appropriate blend of Vedic and modern agricultural science.

Sources of educational objectives would be derived from qualitative, as well as quantitative, surveys of farmer perceptions and needs; studies of contemporary economic, technological, environmental, and social-cultural problems in the different populations and ecological contexts in the country; Vedic, conventional, and alternative agricultural literature (including Indian experience); as well as certain philosophical premises. The reformed curriculum philosophy would reflect several key philosophical concepts:

Humanistic, in the sense of emphasizing learner and teacher consciousness, especially through practicing traditional Vedic rituals and meditation as the foundation for structuring knowledge.

Dharmic and holistic, in the sense of being geared not to providing fragments of knowledge merely to fulfill the requirements of the economic system, but being firmly rooted in Vedic *ṛta* cosmology and *dharma* which sees agriculture as integrator and coordinator of the complete human-nature relationship. The agricultural curriculum would therefore span the full breadth of Vedic knowledge essential for understanding agriculture, including Vedic spirituality and ritual. Alternative agricultural science, for example the principles of permaculture would be included in the holistic curriculum within a Vedic theoretical framework.

Academic, in providing full and systematic coverage of branches of Vedic theory essential to an understanding of agricultural practice. These would include, at a minimum: Vedic texts explicating principles of Vedic cosmology relating to agriculture and knowledge of Vedic agricultural practices; *Jyotish*; *Karmakanda*; *Gandhaarva*; *Sthapatya Veda*; *Vrikshya Veda* (on silviculture); and *Ayurveda*. Ayurvedic study would expose learners to principles of population control, health (human, animal, and plant), medicinal uses of local plants, food purity, and nutrition. Modern agricultural scientific knowledge would be studied as far as possible in light of the Vedic theoretical framework.

Experiential, in order to ensure that all involved in Nepal's agricultural sector understand Vedic knowledge in the best way in which it can be understood, i.e. from direct experience especially of the role of Vedic ritual and consciousness in agricultural praxis. The aim would be to blend the study of classical Vedic theory with contemporary practice in establishing the basis of all curricula.

Social reconstructionist, in deconstructing historical trends which have influenced the purity and integrity of the Vedic tradition. Also in providing opportunity for authentic dialogue, reflection, realization, concern for social reform, and the reconstruction of alternative agricultural science based on synthesis of Vedic and modern agricultural knowledge. Critical in this concept is the establishment of a relationship of mutual trust between teachers and learners, and exchange of knowledge among Vedic specialists and farmers and between them and modern agricultural scientists.

The reformist curriculum would provide a wide variety of learning experiences at all levels (primary, secondary, higher education, nonformal, and informal education) appropriate to achieving its broad range of purposes. Many of the learning experiences would be familiar. Some would be fairly unfamiliar to conventional Western educators. Use of Freirean conscientization methodologies such as participatory action research and popular theater, involving Nepali folk media, would be important in nonformal and informal education. Substantial periods of farm/village internship and apprenticeship experience would be required as national development service for agricultural graduates.

Prior to such assignments, individuals would receive instruction in ethnoscientific techniques to enable them to record local oral histories and proverbs, and to document the state of local indigenous knowledge. This knowledge would remain the property of the local community and would be used in local school and adult education curricula. With local permission, their indigenous knowledge would be documented by a national indigenous knowledge center, an independent, participatory action research center under the Ministry of Education and Culture, for use in education, the media, and in national policy analysis.

One principle of the reformed agricultural education program would be less emphasis on leadership training, which conventionally has been geared to training those who would lead the implementation of a top-down development concept, and more emphasis on broad-based adult education to enable local cultural action involving the entire community. A related concept would be knowledge *exchange* from farmer to

farmer and among indigenous specialists. Agricultural education programs would be designed to enable local experts -- for example, a local Ayurvedic doctor, local priest, astrologer, *janne*, herbalist, shaman, and knowledgeable farmers -- to hold dialogue with visiting specialists in modern agricultural science and Vedic science -- pandits, Ayurvedic specialists, etc. -- with the object of creating enhanced indigenous knowledge appropriate to producing nutritious foods and herbs that enliven total physiology of local cultures in harmony with nature.

Implicit in the structure of such dialogical learning experiences would be the practice of Vedic meditation and the teaching and interpretation of Vedic texts. Vedic teaching and instruction in meditation and *mantras* appropriate to the agricultural profession would form an integral part of agricultural education at all levels. The purpose of such instruction would be to develop the consciousness of all concerned with agriculture, but especially of the farmer.

Clearly, farming in harmony with nature cannot follow a blueprint. Above all, it is a spontaneous process. Frequently, farmers consult one another on their seasonal activities. But in their day-to-day and hour-by-hour actions, farmers are often alone and have to act intuitively. It is for this reason that it would seem important in the Vedic-based curriculum to provide instruction in meditation, basic Vedic prayers, basic *Jyotish* and weather prediction, and basic Ayurvedic techniques that would enable farmers to be able themselves to determine the state of their own *prakriti* (nature) and to sense that of their environment. For many farmers, the effect of such a curriculum would be to confirm for farmers what they already know naively. The Vedic curriculum would make farmers aware of their own consciousness, and renew their confidence in their own knowledge.

One other implication of the reformed curriculum would be the need to structure institutional incentives to reorient agricultural and other research toward investigations into Vedic theory, its application in indigenous knowledge, and its enhancement through modern scientific intervention. Examples of research recommended as a result of the findings of this study are given under conclusions below.

The curriculum would also involve organizational implications, for example in terms of linkages between campuses for Sanskrit/Vedic studies, and agricultural and related sciences, social science, and management campuses.

The findings of the study of Vedic knowledge in Nepal closely paralleled many findings of the more 'global' study of indigenous knowledge. Taken together, the findings and implications of chapters 2,3, and 5 present some **consistent themes**, which are summarized in the following paragraphs.

There is broad unity among Nepali custodians of the Vedic tradition, other indigenous people, and 'alternative' thinkers in the West in rejecting the universal hegemony of the Western model of development which is seen as linked to human rights abuse, imbalances in society and between humans and the environment, loss of nature's biodiversity, and loss of sacred knowledge and moral values.

It is not that everything 'modern' is wrong. What alternative, indigenous, and Vedic perspectives all teach is that there has been distortion of the original moral purpose of science which was to seek understanding about the laws of nature and the truth about God. Instead, science arrogantly seeks to control nature and to 'play' God. A culture of modernity has replaced the originally moral, frugal, ascetic, and religious motivations of the Enlightenment. Alternative, indigenous, and Vedic observers see poverty and under-development in modernity pursued as the *end* of progress.

In contrast to science's arrogance, alternative, indigenous, and Vedic cosmologies all embrace reverence for the Earth, spirituality, and the cultivation of consciousness as their *ends*. Understanding of development is holistic, and consciousness of a wider totality of wellbeing -- from the mind-body-spirit totality of the individual, to societal, natural, and cosmic order -- is integral to this understanding.

The notion of two conflicting paradigms also cuts a consistent track across this study's findings. Vedic pandits in Nepal characterize education in the Western scientific paradigm as the chief 'enemy' of Vedic culture, expressing clearly the perception of indigenous people worldwide about the hostility of the dominant paradigm toward

indigenous knowledge. That the engagement between the two paradigms is fundamentally political is also a solid theme of this study. The theme of conscious and unconscious ignorance of IK found in chapter 3 is also reflected widely by Nepali respondents with respect to the Vedic tradition.

If conscious oblivation and unconscious ignorance of IK by the dominant scientific paradigm continues over one, two, or more generations in a traditional culture, the inevitable result is culture change and therefore loss in some sense of IK. An important theme developed through this research was the notion of 'pure' indigenous knowledge which was found through evidence presented by indigenous people to be sacred knowledge of natural law. Vedic experts in Nepal corroborated this finding and were able to explicate the meaning of pure knowledge by reference to concepts and techniques of consciousness understood within the Vedic theoretical framework.

Equally, this theoretical framework articulates the manner in which practice of Vedic knowledge may no longer be pure -- essentially through lapse of consciousness and spirituality. Nepali custodians of Vedic knowledge explicitly used Nepali terms for 'impure' or 'polluted' (*ashuddha, bitulo*) when describing the status of the Vedic tradition in Nepal today, and explained the problem in terms of consciousness and neglect of *Dharma*.

What is implied by this finding about 'pure IK' is that "you see (or find) what you look for." Depending on how it is implemented, the IK project may work with 'IK as it is', or it may probe deeper to reach 'pure IK'. Reaching pure IK would involve ethnoscientific analysis that investigates with custodians epistemological and cosmological aspects of indigenous knowledge in order to deconstruct historical processes, and then reconstruct the cosmology of the pure knowledge tradition.

Western-educated professionals might naturally feel skeptical about the notion of 'pure IK'. However, alternative thinkers, indigenous people, and Vedic scholars consistently claim that ways of knowing exist which produce finer and more subtle understanding of natural phenomena and hence a more profound vision of development.

Conceptualizing indigenous knowledge as 'pure IK' -- knowledge of natural law --

establishes a clear philosophical premise for arguing that IK is indeed the missing ingredient in the Western notion of progress, and that 'pure IK' contains the potential for correcting imbalances caused by modern scientific and technological progress, and, in this sense, 'integrates' all previous development efforts and revisions.

This study found that holistic understanding and consciousness, cultural diversity, and spirituality and moral values had been the most elusive qualities even in mainstream revisions. However, these very areas which represent the limits of the mainstream appear to be the strengths of indigenous knowledge and cosmology.

A consistent theme of mainstream development critique is the need for reversals, and closure of 'gaps' between what is espoused and actual behavior. Yet the gaps persist, and reversals, for example toward thinking and acting holistically, are hard for the mainstream to accomplish. The emic, indigenous perspective on IK turns the present core-periphery relationship around to make indigenous knowledge and cosmology the core. This ultimate reversal -- back to consciousness and sacred awareness -- would restore what the world lost while ruled by the modern paradigm. This reversal is what indigenous people and Vedic custodians are advocating as the precondition for meaningful development. The kind of IK that this offers may not be 'IK as it is'. Neither are traditional custodians advocating some return to antiquity. The IK they advocate is knowledge of the *eternal*.

This study found that Vedic cosmology closely resembles other indigenous cosmologies in personifying elements of the universe as living beings, or deities, and in its understanding of *rta*, or cosmic order. True knowledge, in light of these cosmologies, is sacred knowledge. Whether Vedic custodians in Nepal or indigenous leaders elsewhere, another commonality based on consciousness of this knowledge is their claim to be 'guides' for humanity.

The unity of thought among alternative thinkers, indigenous people, and Vedic custodians indicates a basis for synthesizing a new mode of knowledge. Instead of incorporating components of IK into the dominant scientific paradigm, the new mode of knowledge logically springs from what Doubleday (69) called a change in the

mainstream's calculus to accommodate cosmologies which understand natural law on a cosmic level as well as in a legal sense. In other words, the mainstream has to accommodate the indigenous, emic perspective in totality, incorporating IK at a deep level instead of at a surface level. Another way of seeing the synthesis is in terms of what indigenous people advocate -- i.e. a synthesis between resources and tools contributed from the advanced technology of the Western world, and social vision to negate the present order primarily through struggle in the third world (82).

An intellectual question that arises is whether this constitutes a mainstream revision, or a paradigm shift, or some dialectic between the two. How does change come? Through what process of accommodation or negotiation? Hollinger (113) asks a similar question about postmodernity -- whether it arises as a radical departure from the modern, through radicalization from within, or, "as is closer to the truth, both at once... The issue, to echo Foucault, is not whether one is for or against these phenomena; one might as well try to be "for' or "against" the modern world. The issue is one of understanding" (p.5).

Hollinger's approach seems a sensible way of approaching the question of paradigm change or shift discussed by Doubleday. Without trying to appear trite, this author suggests, based on the testimony found in this study, that change comes essentially through consciousness, and that some of the shifts occurring right now -- more radical, participatory agricultural research paradigms, mainstream awareness about biological and cultural diversity, and the explosion of interest in IK -- are signs of a change in global consciousness. They may also be taken as evidence either that the mainstream *can* in time accommodate other cosmologies, or that the alternative, holistic, indigenous paradigm can regain dominance and incorporate the tools and agencies of the modern knowledge system under indigenous guidance. In a way, as Hollinger suggests, it does not matter which way round it is perceived to happen. What matters is the altered state of consciousness.

Either way, indigenous people and Nepali Vedic custodians alike stress that for synthesis of the new mode of understanding to happen properly, IK must be strong, and *pure*.

It follows that this pure knowledge of deeper-level IK is obtainable only through those custodians who maintain the tradition of cosmic awareness. This became evident in the Nepali responses to this study. Ordinary farmers might only say of a ritual practice, "this is the way we always did this." An etic perspective stops there. "It is just ritual. The farmers do not know where the ritual came from." Yet, pandits, priests, and other Vedic specialists can provide the theory and cosmology underpinning ritual practice. It does not seem necessary for the original of rituals to be known fully by the performer. What matters is the act of performance, and the religious devotion accompanying the act. The rest is taken care of by nature, or the cosmos. Nature, it is understood, responds to the vibrations of the Sanskrit *mantras* and other ceremonies when accurately performed.

So far, it appears that there is no way that modern scientific knowledge can approach the subtleties of subjective insight that is the province of custodians of 'pure IK'. For, as has been said, the critical difference between modern scientific knowledge and IK appears to be the *level* of the known, process of knowing, and knower. Modern science sees that which is observable. Pure indigenous knowledge 'sees', sometimes literally, the unobserved spiritual level of energy and essence. Modern science may be unaware of many levels of being, and functioning, and therefore of consequences of its interventions. Pure IK will be, and from an intuitive level can judge the effect on *rta* of any action.

This *rta* concept from the Vedas, and its elaboration by pandits, helps to explain a phenomenon reported about indigenous people's agriculture in various parts of the globe - that it *enlivens* nature. Pure IK, including especially that elaborated by Vedic knowledge, offers a distinctly enhanced view of agriculture based on the consciousness and religious and spiritual devotion of the farmer. This consciousness is effortless and naive. Elements of this enhanced view involve veneration of the natural world, purity of consciousness (because the world is as we are), the concept of agriculture coordinating the human-nature relationship within a framework of cosmic harmony, the concept of wellbeing and purity throughout the totality of that framework (because everything, including the food we eat, affects us because all is interconnected), and a profound

relationship between agriculture and health. Therefore, an indigenous or Vedic approach to agriculture stresses subtly different priorities and modes of agricultural development, with quite radical implications for agricultural education curriculum which were discussed above.

A final theme is the remarkable conceptual unity between Vedic and other indigenous cosmologies, and therefore the potential usefulness of the highly articulated Vedic theoretical framework as a cosmological and epistemological framework for understanding other indigenous knowledge systems.

Conclusions of this research study are discussed by objective. Starting with the **first objective** of analyzing mainstream and alternative development thought, the following **conclusions** were reached:

1. There are two fundamentally different ways of looking at the world and of conceiving development -- a materialistic, technocratic world view based on modern scientific cosmology, and a life-centered, democratic world view akin to the holistic, intuitive cosmologies of indigenous people.
2. Many of the problems and imbalances consequent to modern development reflect modern culture's *loss* in particular of holistic ways of knowing, moral values, and spiritual consciousness that occurred as modern science became divorced from its origins in moral philosophy.
3. Left to itself, the mainstream, by definition, has an inherently limited ability to change, or introduce effective revisions. In the hands of its cadre of professionals, gaps between espoused and actual behavior plague such efforts.
4. Outside the mainstream lies a rich resource of alternative ideas and experience with the potential to compensate for the limits of the mainstream, basically through being founded in alternative cosmologies to the modern scientific paradigm.
5. Fundamental transformation and humanization of development depends on a process of assimilation of these alternative cosmologies and value systems into mainstream culture.

6. There are some signs of change in dominant cultural values. But the major challenge for the IK project can be conceptualized in terms of accelerating mainstream culture change towards greater understanding and acceptance of alternative cosmologies.

Based on these conclusions, two **recommendations** are made:

1. The process of IK rediscovery and promotion should be conceived within an idealistic/social reconstructionist philosophy with the prime purpose of re-awakening in mainstream culture a realization of need for genuine participation, political and human rights, enhanced understanding, cultural diversity, and moral/spiritual consciousness.
2. Interest in IK practices should be conceptualized as a *means* of attaining this higher goal.

With regard to the **second objective**, the analysis of IK discourse, the following **conclusions** were reached:

1. Controlled by Western-educated professionals in mainstream agencies, the promotion of IK would face essentially similar sets of constraints to those that limited previous development revisions. Therefore, the IK project squarely faces the philosophical choice between mainstream and alternative approaches observed in chapter 2.
2. The choice is fundamentally political, and involves radical change in values.
2. If ethnoscientific analysis does not probe into the epistemological origins and cosmological underpinnings of indigenous knowledge, IK may tend to be viewed as isolated practices and system components which are essentially interchangeable with modern scientific knowledge. Such a view of IK is attractive in pursuit of sustainability goals which seek to perpetuate mainstream culture. However, their incorporation into mainstream development may abstract them from their parent IK system cosmology, and undermine the life of that parent system in the long run.
3. The real meaning and challenge of IK lies in the nature of its underlying cosmology. To indigenous people, the essence of this cosmology is consciousness extending into sacred and cosmic realms which provides a holistic knowledge and

understanding of life in compliance with natural law.

4. This traditional, intuitive knowledge which lies at the basis of IK practices remains of vital importance to the continued health and wellbeing of all life on Earth. Through its finer understanding of nature and her processes, it also represents the most subtle basis for agriculture, whose purpose is to coordinate harmony between human life and nature and to enhance and *enliven*, rather than manipulate or control, nature.

5. This knowledge of natural law represents original, 'pure' indigenous knowledge tradition. In some societies this pure tradition is virtually lost. However, in virtually all indigenous cultures it is being maintained, and custodians with the pure knowledge can still be found. Where it exists, 'pure IK' represents the key to IK operationalization.

6. Conceptualization of IK as an alternative cosmological framework may also be the key to national policy impact by broadening IK beyond the limited and localized level of isolated cases and projects.

7. The synthesis of a *new mode of knowledge* only appears possible if the concept of 'pure IK' is accepted and if ethnoscientific techniques reveal the full cosmology and epistemological origins of IK. Anything less than this treats IK as fragments of knowledge and incorporates them into the Western knowledge system. What alters the *quality* of knowledge, and renders it a new *mode* of knowledge, are the deeper subjective intuitions and insights contributed through other ways of knowing, and explanations based on theoretical frameworks which are unavailable through Western perception and normal scientific observation. This synthesis is only made possible by an emic understanding of IK.

This perspective on IK involves a host of **implications** and therefore recommendations for the way IK is defined and operationalized. These now follow:

1. IK rediscovery and promotion should be conceptualized primarily as concerned with the recovery of indigenous cosmology, or consciousness. The recovery of practices or artifacts, and even political goals of human rights and self-determination pursued through archival work and cultural activism, should be regarded as objectives in pursuit of the more radical, profound, and therefore more powerful primary purpose.

2. In order to establish the above primary purpose of the IK project on a firm theoretical foundation, IK should be defined in terms that clearly articulate this purpose. A tentative definition based on how indigenous people characterize what is important about their knowledge was offered on page 234.
3. The consciousness perspective leads to an important strategic planning and organization principle for the IK project, and that is that it should 'ride the waves' of enhanced societal consciousness as identified by indigenous people. In other words, the IK project should move in the directions in which 'pure IK' is valued. Currently, areas where enhanced global consciousness is developing include the environment, biodiversity conservation, holistic health and nutrition and traditional medicine, and concern for food quality. Concerns for human rights and cultural diversity also offer strategic opportunities. In the near future, another 'wave' may involve energy. Where sustainable, or alternative, agriculture is conceptualized in terms of nature-regarding approaches (i.e. consistent with indigenous cosmologies and methods) this too represents an appropriate 'wave'.
4. It is the duty of the IK project to articulate *indigenous perspectives*, and not to undermine these perspectives or compromise indigenous control in the war between cosmologies.
5. In light of this study's finding about 'pure IK', certain principles and steps may be appropriate in IK rediscovery, promotion, and synthesis with modern scientific knowledge.

Archival work within an ethnoscientific/cultural activist paradigm is required to deconstruct historical processes responsible for the state of IK as it is, and to reconstruct the epistemology and cosmology of 'pure IK'.

Custodians of the IK tradition should control and guide all stages of IK revival. There should be no hesitation to use the term revival.

Indigenous cosmology, as well as the state of current local practice, should form the framework for establishing basic development goals and the relationship with modern scientific knowledge and technology (MSK). MSK should be used to enhance understanding of, and interpret, IK theory and applications, and to help establish its strengths and limitations.

IK should never be 'tacked on' as an afterthought, as was often the case with Social Soundness Analysis, Environmental Impact Assessment, and similar project requirements. IK should be *the articulation point* for agriculture.

6. In light of this study's findings about alternative development, the IK project should be conceptualized as a *movement*, or, more accurately, as *part of* the larger, global, alternative development movement. Some specific recommendations follow from such a conceptualization:

To minimize risk of incorporation by mainstream-oriented agencies, the IK project should look for support and solidarity through relationships with other related movements. Above all, it should receive inspiration and strategic guidance from those representing indigenous perspectives.

Conceptually, the IK project should aim to link 'islands' of consciousness. Although Christian institutions have done much to destroy indigenous knowledge historically, niche theory suggests that religious organizations may provide support for alternative life-style issues (). The possibility that inter-faith organizations may now support 'pure IK' should be explored.

Personal action forms the basis of alternative movements involving changes in values. Opportunities should be sought on a wide scale to provide cultural exchanges involving etic-emic encounters especially for Western-educated people. Volunteer programs, alternative tourism (e.g. ecotourism or, perhaps, 'cultural tourism'), and alternative business ventures might foster such encounters if controlled authentically by indigenous people.

Policy advocacy to increase legal resources and social sector assignment would appear to be crucial elements of any national IK strategy.

The IK project should extend its activities into alternative, indigenously-based and controlled economic and trading programs. The ultimate aim should be to have an impact on mainstream cultural and economic values, increasing the value placed on holistic produce that enhances human consciousness and the quality of all life on earth.

7. To implement these recommendations, the IK resource centers should conceptualize their role as involving: research and policy intelligence aimed at enhancing policy-maker consciousness, education in the broadest sense, and support to help IK custodians mobilize their knowledge tradition. To fulfill these roles they should consider giving priority to the following tasks:

Identification of the full range of educational opportunities (formal and nonformal, public/adult to KG) for promoting understanding and use of pure IK tradition and

local knowledge that reflects that tradition.

Penetration of the entire education policy system in order to engender reform of educational curricula.

Support for expert exchanges among custodians of indigenous cosmology and indigenous knowledge specialists to enable them to reconstruct an indigenous theoretical framework together with applications for their culture's development.

Communication of indigenous expert opinion through meetings with indigenous organizations and indigenous media (and, with custodians' approval, through modern organizations and media) in an effort to consult populations on indigenously-based development policies.

Strategic organization and policy advocacy work through networking, coalition-building, and forums for indigenous exchange of opinion with the modern sector, in order to articulate IK into the national policy agenda.

8. Integral to the above tasks should be an active research program. Research priorities indicated by this study would include:

Cosmological and epistemological research into pure knowledge traditions in order to firmly ground IK within a traditional theoretical framework that explicates indigenous understanding of natural law.

Qualitative case study research to investigate factors explaining the 'purity' of IK tradition, and the factors either enhancing or inhibiting its preservation, in different cultural contexts.

Investigation of the relationship between purity of indigenous cosmology and maintenance of sacred traditions and social-ecological harmony.

Analysis of *indigenous* literature on IK, especially writings of custodians of the pure IK tradition on the nature of that tradition and constraints it faces.

Policy-oriented research to identify conditions enhancing and inhibiting vitality of indigenous culture and knowledge traditions as defined by this study. Such research would cover:

Experience of related movements and networks that may contain lessons on effective processes for inducing change in mainstream values and behavior.

Modes of articulation with state institutions, possibly using similar research methods to those used in studies of NGO-state relations (i.e. studies of non-governmental organization policy advocacy, strategic organization, etc.), aimed at identifying which state policies genuinely protect and enhance indigenous cosmology, and which indigenous organization strategies and methods effectively impact state policy.

Cases where traditional cosmology was used in national IK revival and IK-based development policy. In such cases, investigation into process, leadership, policy actors, role of networks and coalitions, external support, sequences and combinations of activities, inter-organizational relations, and mode of replication or expansion. Also the role of cultural and religious factors in reconstructing alternative policies.

Cases of successful organizations that used cultural action and revival of pure indigenous knowledge in project work, looking especially at organizational culture and methods of mobilizing the pure tradition.

Comparative policy analysis of IK resource center initiatives according to policy problem, culture, region, type of natural resource environment etc. in order to explore processes of revival -- actors involved, roles played by different institutions, policy functions performed by IK centers, and impact on national policy.

The UN Decade of Culture and Development may produce interesting cases for comparative analysis in order to learn lessons on IK revival in relation to cultural revival and empowerment.

Studies of roles of different types of people's movements to investigate the relationship between political and cultural action and IK recovery and promotion.

Relationship between NGO/PVO type and mode of interaction with indigenous people's organizations and their custodians, and hence mode of IK recovery and use.

Much further work needs to be done in order to answer the kinds of questions about IK posed on page 112, and to analyze the IK discourse systematically as noted on page 226.

9. Finally, it is recommended that conferences be held at national, regional, and global levels which bring together, firstly, custodians of pure IK tradition, and, later, the full range of political players with interests in IK. Meetings of custodians should consider the nature of the task of IK revival and the philosophical framework for that task. Efforts should be made to find public and private sponsors in order to establish foundations to support the indigenous movement.

Regarding the third objective, which concerned how the Vedic tradition is interpreted and applied today in Nepal, the conclusions reached were the following:

1. The Vedic tradition, the *Sanaatana Dharma* (indigenous *Dharma*) of Nepal, is the root of Hindu-Buddhist *Dharma*, and therefore of the sacred traditions and indigenous knowledge of virtually all Nepalis. It also provides an appropriate framework for understanding other Nepali IK systems.
2. Custodians of the Vedic tradition are still maintaining the purity of the original 6,000 year-old knowledge tradition.
3. It is a progressive and highly articulated knowledge tradition that perfectly exemplifies the quality of indigenous people's consciousness and cosmology of attunement with natural law.
4. The testimony of Vedic custodians supports the hypothesis of this study about the existence of 'pure IK'. Nepali Vedic specialists clearly favor an emic mode of synthesizing Vedic and modern scientific knowledge.
5. Ordinary Nepalis' understanding of the Vedic origin of their religious rituals has been eroded by successive historical influences. However, the Vedic concepts of social *dharma* and ecological *rta* are still universally understood in Nepal, and cited as ordinary people explain recent political, social, economic, and environmental deterioration in the country.
6. The Western educational paradigm has been responsible for the most recent, pervasive undermining of Vedic tradition in Nepal, especially through the new curricula in the education sector and the staffing of policy and technical levels in government with Western-educated personnel.
7. As a result of Western education and foreign donor influence, Nepali opinion has tended to become divided between technocrats and those raised in indigenous traditions. A gap has developed between especially the professionals who implement development and the recipients, the people. However, even though some modern Nepali agricultural professionals recognize the relevance of IK practices in identifying sustainable development activities, Vedic specialists believe that the Vedic tradition can only play an effective role if reintroduced *in totality*, involving revival of spiritual and religious consciousness.

8. Reintroduction of the totality of Vedic knowledge, including all its theoretical and applied branches, would provide an holistic, comprehensive, enhanced *basis* for Nepali development. Vedic knowledge offers profoundly ecologically sound and subtle natural principles for home design, spatial (including farm) planning, forestry, all aspects of agricultural practice, nutrition, human and animal health, population policy, and education, to name just some of its applications. There is historical as well as contemporary evidence (from NGOs implementing sustainable agriculture/permaculture approaches in Nepal) that agriculture based on Vedic knowledge would also be productive.

9. Nepal still possesses rich indigenous resources of value domestically and internationally. After meeting the needs of her own people, her export strategy should focus on products in which her traditional Vedic culture has expertise, namely products of all branches of Vedic knowledge, which especially includes *sattvik* agricultural and medicinal products and treatments that enliven physiology.

10. Because of *Kuldharm* and *Varnaashram Dharma* (the Vedic principles establishing social harmony amid cultural diversity), revitalization of Vedic knowledge and its reintroduction in national planning and throughout Nepali society would not face insurmountable obstacles. Constitutionally, Nepal is a Hindu state. Practice of Vedic rituals is ingrained in daily religious observance, and is clearly related to indigenous knowledge of herbal treatments and agricultural practices. Even if weakened over recent decades, a widespread infrastructure is in place of temples, temple schools, priests, Ayurvedic facilities, Vedic pandits, astrologers, Sanskrit scholars, and traditional healers. Although a fairly massive governmental infrastructure was developed to further modern development, development under this paradigm has largely failed. Public opinion and the new, struggling democratic political leadership would both endorse an indigenous development strategy.

11. Nepal represents a rare case of an entire country which could feasibly redirect its entire development effort towards a path based on its ancient knowledge tradition. As such, it would provide a most valuable model for other societies' efforts to articulate

alternative cultural understandings and models of development.

Based on these conclusions, the following recommendations are made:

1. Vedic knowledge should form the basis for synthesizing a new mode of knowledge with modern scientific knowledge in order to found agriculture and all realms of Nepali development firmly within Vedic social *dharma* and consciousness of natural law.
2. There should be fundamental curriculum change throughout the Nepali education system to reintroduce Vedic education, revive Vedic consciousness throughout Nepali society, and produce a future generation of specialists in all branches of Vedic knowledge, including branches of direct relevance to agriculture. Vedic concepts and practices learned at home should be reinforced in children's consciousness from their very first days in pre-school.
3. Ayurveda should form the basis of an integrated nutrition-health policy for Nepal, and the dietary and herbal requirements for an Ayurvedic health system should form a core concept in Nepal's agricultural policy.
4. Relevant specialists in Vedic knowledge should be incorporated into government planning and management in all fields of Nepali development, including agriculture, and should work on an equal, collegiate basis with professionals trained in the modern scientific paradigm.
5. Thorough orientation in the totality of the Vedic tradition should form a requirement in the recruitment of all foreign personnel working in Nepal. The Nepal government should say to donors: "This is our tradition. The people understand and want it. Our policy is to support and enhance it."
6. All interested in the promotion of IK in Nepal should work closely with custodians of the Vedic tradition, and support them if necessary in policy advocacy and political organization to defend their knowledge and reassert its relevance in modern development.
7. An active research program is necessary to further these objectives. Examples of research include:

Exploration of the parameters of a comprehensive development plan for Nepal based on a Vedic synthesis of indigenous and modern scientific knowledge. Of particular interest would be the parameters of an integrated health-nutrition-

agriculture policy within an Ayurvedic framework.

Investigation of other indigenous knowledge systems in Nepal and their relationship to Vedic culture.

Further study of ways in which Vedic knowledge forms the epistemological basis of current agricultural practices in Nepal.

Study of the nature of visioning of pure IK by contemporary Vedic seers and saints.

Study of the relationship between cultural and biological diversity within a natural law framework, possibly by analyzing variations in IK with micro-changes in locality.

Almost unlimited potential for study of branches of Vedic knowledge in Nepal, India, and elsewhere, and *documentation* of Vedic/Ayurvedic knowledge -- for example, Vedic rituals and agricultural formulae, *mantras* and their effects, knowledge of herbs and their production and utilization in different seasons and localities, and the role of *Jyotish* in influencing climate and plant growth.

Finally, beyond the Nepali context, there appears to be great potential for research into ways in which the Vedic tradition provides a framework for understanding the cosmological and epistemological basis of other indigenous knowledge systems.

The fourth objective of this study concerned implications for agricultural education in Nepal. **Conclusions** resulting from this study were:

1. The Vedic tradition offers a perspective on agriculture that is holistic, biologically diverse, ecological, oriented to human and animal wellbeing, productive, and highly suited to Nepali conditions. Moreover, it is reflected in traditional Nepali farming practice.
2. Nepal's modern agricultural institutions and personnel have been geared only to implementing the Green Revolution agricultural paradigm which, by itself, has proved inherently unsustainable and inaccessible in Nepali conditions.
3. Agricultural education and extension in Nepal has been modelled primarily on American agricultural educational philosophy and experience, oriented towards the transfer of technology research and extension model.
4. The reform of agricultural education curriculum in Nepal represents a major

undertaking, but one which appears highly justified given the above circumstances.

In light of these conclusions, the following **recommendations** are made:

1. Vedic knowledge should form the basis of Nepali agricultural development, enhanced where possible by modern agricultural scientific knowledge.
2. Specialists in all branches of Vedic knowledge pertaining to agriculture, as well as people knowledgeable in conventional and alternative agricultural science, should be consulted to establish the guiding philosophy for agricultural curriculum reform.
3. Diverse sources should be researched in establishing curriculum objectives.
4. The philosophy for reforming curriculum should blend humanistic, *dharmic*/holistic, academic (emphasizing Vedic theory), experiential, and social reconstructionist curriculum concepts.
5. Learning experiences should include radical popular education and participatory action research methodologies, rural internship and apprenticeship experience involving ethnoscientific research, knowledge exchange among indigenous specialists, emphasis on dialogical approaches to knowledge creation, meditation, contemplation of Vedic agricultural *mantras*, and Vedic rituals to develop consciousness of all agricultural practitioners.
6. Both government and donor agencies should provide incentives to encourage basic and applied research in the field of Vedic agriculture and its enhancement through modern scientific interventions.
7. The government's Ministry of Education and Culture, and Tribhuvan University should dramatically upgrade the status of Sanskrit and Vedic education in Nepal, and create active research and teaching links between Vedic studies and studies in agriculture and other fields.

CHAPTER 7. SUMMARY

The broad purpose of this study was to explore the ethnoepistemology of IK, investigating especially the role of indigenous cosmologies and sacred beliefs in upholding indigenous knowledge systems. The particular purpose was to see to what extent Nepali agricultural practice is influenced by the Vedic tradition which is a main source of Indigenous Knowledge in Nepal. The specific objectives of the study were:

To analyze mainstream and alternative development thought and experience establishing the context for IK discourse.

To analyze trends in indigenous knowledge discourse, and to find out the meaning and relevance of IK as articulated by advocates and custodians of these knowledge systems.

To discover how the cosmology and sacred beliefs of the Vedic tradition are interpreted and applied in the context of modern development, particularly in agriculture, in Nepal.

To determine the implications of these Vedic traditions and knowledge for agricultural education in Nepal.

The methodology for this study involved literature review, naturalistic inquiry, and deductive reasoning. Three main areas of literature were reviewed: international literature on development, in order to establish a paradigmatic context for IK; international literature on IK, primarily to investigate characterizations and definitions of IK by its advocates and traditional custodians; and Vedic literature, in order to develop an understanding of Vedic cosmology and the approach to agriculture in the Vedic texts.

There were five types and levels of data collected from Nepal: i) textual material on Vedic science and philosophy; ii) current interpretations of the texts by pandits; iii) implementation of knowledge by astrologers, priests, and Ayurvedic physicians serving a community; iv) knowledge of, attitudes towards, and practice of indigenous knowledge by rural farmers; v) National policy documents published by His Majesty's Government of Nepal.

The procedure for collecting these data involved correspondence, and interviewing of respondents by the Nepali research assistants.

The chief limitation of this study pertained to the naturalistic component, the study of Vedic knowledge and agriculture in Nepal, being undertaken indirectly, i.e., by research assistants. However, several factors discussed in chapters 4 and 6 compensated for this limitation and helped ensure that the research findings and conclusions drawn were credible and trustworthy.

A detailed summary of findings for all four of this study's objectives, together with implications, conclusions, and recommendations, is provided in chapter 6. This chapter abstracts the essence of that summary.

A striking finding of this study was the conceptual unity among Nepali Vedic custodians, perspectives of other indigenous peoples, and "alternative thought" of many social groups and movements outside the development mainstream in industrialized societies, whose cosmologies all embrace reverence for the Earth, spirituality, and the cultivation of consciousness as their ends. Understanding of development is holistic, and consciousness of a wider totality of wellbeing -- from the mind-body-spirit totality of the individual, to societal, natural, and cosmic order -- is integral to this understanding.

An important theme developed through this research was the notion of "pure" indigenous knowledge which was found through evidence presented by indigenous people to be sacred knowledge of natural law. Vedic experts in Nepal corroborated this finding and were able to explicate the meaning of pure knowledge by reference to concepts and techniques of consciousness understood within the Vedic theoretical framework.

What is implied by this finding about "pure IK" is that "you see (or find) what you look for." Depending on how it is implemented, the IK project may work with "IK as it is", or it may probe deeper to reach "pure IK". Reaching pure IK would involve ethnoscientific analysis that investigates with custodians epistemological and cosmological aspects of indigenous knowledge in order to deconstruct historical processes, and then reconstruct the cosmology of the pure knowledge tradition.

Conceptualizing indigenous knowledge as "pure IK" -- knowledge of natural law - establishes a clear philosophical premise for arguing that IK is indeed the missing ingredient in the Western notion of progress, and that "pure IK" contains the potential for correcting imbalances caused by modern scientific and technological progress, and, in this sense, "integrates" all previous development efforts and revisions.

This study found that holistic understanding and consciousness, cultural diversity, and spirituality and moral values had been the most elusive qualities even in mainstream revisions. However, these very areas which represent the limits of the mainstream appear to be the strengths of indigenous knowledge and cosmology.

The emic, indigenous perspective on IK turns the present core-periphery relationship around to make indigenous knowledge and cosmology the core. This ultimate reversal -- back to consciousness and sacred awareness -- would restore what the world lost while ruled by the modern paradigm. This reversal is what indigenous people and Vedic custodians are advocating as the precondition for meaningful development.

The unity of thought among alternative thinkers, indigenous people, and Vedic custodians indicates a basis for synthesizing a new mode of knowledge. Instead of incorporating components of IK into the dominant scientific paradigm, the new mode of knowledge logically springs from a change in the mainstream's calculus to accommodate cosmologies which understand natural law on a cosmic level. In other words, the mainstream has to accommodate the indigenous, emic perspective in totality, incorporating IK at a deep level instead of at a surface level.

The *rta* (cosmic harmony) concept from the Vedas, and its elaboration by pandits, helps to explain a phenomenon reported about indigenous people's agriculture in various parts of the globe -- that it *enlivens* nature. Pure IK, including especially that elaborated by Vedic knowledge, offers an enhanced view of agriculture based on the consciousness and religious and spiritual devotion of the farmer. Elements of this enhanced view involve veneration of the natural world, purity of consciousness, the concept of agriculture coordinating the human-nature relationship within a framework of cosmic harmony, the concept of wellbeing and purity throughout the totality of that framework,

and a profound relationship between agriculture and health. Therefore, an indigenous or Vedic approach to agriculture stresses subtly different priorities and modes of agricultural development, with quite radical implications for agricultural education curriculum.

With regard to each of the objectives, certain conclusions, implications, and recommendations can be highlighted.

Objective 1

Many of the problems and imbalances consequent to modern development reflect modern culture's *loss* in particular of holistic ways of knowing, moral values, and spiritual consciousness that occurred as modern science became divorced from its origins in moral philosophy.

Left to itself, the mainstream, by definition, has an inherently limited ability to change, or introduce effective revisions. In the hands of its cadre of professionals, gaps between espoused and actual behavior plague such efforts.

Fundamental transformation and humanization of development depends on a process of assimilation of alternative cosmologies and value systems into mainstream culture.

The process of IK rediscovery and promotion should be conceived within an idealistic/social reconstructionist philosophy with the prime purpose of re-awakening in mainstream culture a realization of need for genuine participation, political and human rights, enhanced understanding, cultural diversity, and moral/spiritual consciousness.

Objective 2

The real meaning and challenge of IK lies in the nature of its underlying cosmology. To indigenous people, the essence of this cosmology is consciousness extending into sacred and cosmic realms which provides a holistic knowledge and understanding of life in compliance with natural law.

This traditional, intuitive knowledge which lies at the basis of IK practices remains of vital importance to the continued health and wellbeing of all life on Earth.

Through its finer understanding of nature and her processes, it also represents the most subtle basis for agriculture, whose purpose is to coordinate harmony between human life and nature and to enhance and *enliven*, rather than manipulate or control, nature.

This knowledge of natural law represents original, "pure" indigenous knowledge tradition. In some societies this pure tradition is virtually lost. However, in virtually all indigenous cultures it is being maintained, and custodians with the pure knowledge can still be found. Where it exists, "pure IK" represents the key to IK operationalization.

IK rediscovery and promotion should be conceptualized primarily as concerned with the recovery of indigenous cosmology, or consciousness.

In order to establish the above primary purpose of the IK project on a firm theoretical foundation, IK should be defined in terms that clearly articulate this purpose. Based on the evidence of this study, IK may be tentatively defined as:

The sacred knowledge of indigenous people, understood as cultures that have evolved over many generations in a particular natural environment and that maintain, through spiritual practices, consciousness of universal natural law as it is expressed in local forces of nature.

This definition is expanded upon in chapter 6.

The consciousness perspective leads to an important strategic planning and organization principle for the IK project, and that is that it should "ride the waves" of enhanced societal consciousness as identified by indigenous people. In other words, the IK project should move in the directions in which "pure IK" is valued. Currently, areas where enhanced global consciousness is developing include the environment, biodiversity conservation, holistic health and nutrition and traditional medicine, and concern for food quality.

In light of this study's finding about "pure IK", certain principles may be appropriate in guiding "the IK project". One important principle appears to be that custodians of the pure IK tradition should control and guide all stages of IK revival.

In light of this study's findings about alternative development, the IK project should be conceptualized as a *movement*, or, more accurately, as *part of* the larger, global, alternative development movement.

IK resource centers should conceptualize their role as involving: research and policy intelligence aimed at enhancing policy-maker consciousness, education in the broadest sense, and support to help IK custodians mobilize their knowledge tradition.

Integral to IK resource center tasks should be an active research program.

Research priorities include:

Cosmological and epistemological research into pure knowledge traditions in order to firmly ground IK within a traditional theoretical framework that explicates indigenous understanding of natural law.

Policy-oriented research to identify conditions enhancing and inhibiting vitality of indigenous culture and knowledge traditions as defined by this study.

An example of policy-oriented research would be study of cases where traditional cosmology was used in national IK revival and IK-based development policy. Studies would investigate process, leadership, policy actors, role of networks and coalitions, external support, sequences and combinations of activities, inter-organizational relations, and mode of replication or expansion. Also the role of cultural and religious factors in reconstructing alternative policies.

A final recommendation was that conferences be held at national, regional, and global levels which bring together, firstly, custodians of pure IK tradition, and, later, the full range of political players with interests in IK. Meetings of custodians should consider the nature of the task of IK revival and the philosophical framework for that task. Efforts should be made to find public and private sponsors in order to establish foundations to support the indigenous movement.

Objective 3

The Vedic tradition, the *Sanaatana Dharma* (indigenous *Dharma*) of Nepal, is the root of Hindu-Buddhist *Dharma*, and therefore of the sacred traditions and indigenous knowledge of virtually all Nepalis. It also provides an appropriate framework for understanding other Nepali IK systems.

The testimony of Vedic custodians supports the hypothesis of this study about the

existence of "pure IK". Nepali Vedic specialists clearly favor an emic mode of synthesizing Vedic and modern scientific knowledge.

Reintroduction of the totality of Vedic knowledge, including all its theoretical and applied branches, would provide an holistic, comprehensive, enhanced *basis* for Nepali development.

Nepal still possesses rich indigenous resources of value domestically and internationally. After meeting the needs of her own people, her export strategy should focus on products in which her traditional Vedic culture has expertise, namely products of all branches of Vedic knowledge, which especially includes *sattvik* agricultural and medicinal products and treatments that enliven physiology.

Because of *Kuldharma* and *Varnaashram Dharma* (the Vedic principles establishing social harmony amid cultural diversity), revitalization of Vedic knowledge and its reintroduction in national planning and throughout Nepali society would not face insurmountable obstacles.

Vedic knowledge should form the basis for synthesizing a new mode of knowledge with modern scientific knowledge in order to found agriculture and all realms of Nepali development firmly within Vedic social *dharma* and consciousness of natural law.

There should be fundamental curriculum change throughout the Nepali education system to reintroduce Vedic education, revive Vedic consciousness throughout Nepali society, and produce a future generation of specialists in all branches of Vedic knowledge, including branches of direct relevance to agriculture.

Ayurveda should form the basis of an integrated nutrition-health policy for Nepal, and the dietary and herbal requirements for an Ayurvedic health system should form a core concept in Nepal's agricultural policy.

An active research program is necessary to further the objective of founding Nepali development on her *Sanaatana Dharma*. One key research area would be to explore the parameters of a comprehensive development plan for Nepal based on a Vedic synthesis of indigenous and modern scientific knowledge. Of particular interest would be

the parameters of an integrated health-nutrition-agriculture policy within an Ayurvedic framework.

Finally, beyond the Nepali context, there appears to be great potential for research into ways in which the Vedic tradition provides a framework for understanding the cosmological and epistemological basis of other indigenous knowledge systems.

Objective 4

The study of Vedic knowledge has profound implications for agricultural education in Nepal.

The Vedic tradition offers a perspective on agriculture that is holistic, biologically diverse, ecological, oriented to human and animal wellbeing, productive, and highly suited to Nepali conditions. Moreover, it is reflected in traditional Nepali farming practice.

Several specific recommendations followed from this study's findings and conclusions. They included:

Vedic knowledge should form the basis of Nepali agricultural development, enhanced where possible by modern agricultural scientific knowledge.

Specialists in all branches of Vedic knowledge pertaining to agriculture, as well as people knowledgeable in conventional and alternative agricultural science, should be consulted to establish the guiding philosophy for agricultural curriculum reform.

Learning experiences should include radical popular education and participatory action research methodologies, rural internship and apprenticeship experience involving ethnoscientific research, knowledge exchange among indigenous specialists, emphasis on dialogical approaches to knowledge creation, meditation, contemplation of Vedic agricultural *mantras*, and Vedic rituals to develop consciousness of all agricultural practitioners.

Both government and donor agencies should provide incentives to encourage basic and applied research in the field of Vedic agriculture and its enhancement through modern scientific interventions.

The government's Ministry of Education and Culture, and Tribhuvan University should dramatically upgrade the status of Sanskrit and Vedic education in Nepal,

and create active research and teaching links between Vedic studies and studies in agriculture and other fields.

Final conclusion

Two key conclusions are reached based on this study's overall analysis. One is that a focus on incorporating components of indigenous knowledge into mainstream development approaches may, like past revisions to the dominant paradigm, have only marginal impact. Instead, the sacred, holistic dimension of indigenous knowledge corresponds most closely to the social, spiritual, and moral dimensions that modern notions of development have lacked.

The second conclusion is that synthesis of indigenous perspectives with the tools and technologies of modern science within the emerging "alternative" world view of postpositive, postmodern culture in Western society is possible. It is in this synthesis, and in rediscovering within the sacred, holistic dimension of indigenous knowledge the original hopes of the Enlightenment that the revival of interest in indigenous knowledge may contribute most to human progress.

BIBLIOGRAPHY

1. Abbott, Eric. Personal communication, Ames, Iowa, 1992.
2. Acharya, Meena. Statistical Profile of Nepalese Women: A Critical Review; CEDA, Tribhuvan University Press: Kathmandu, 1979.
3. Acharya, Shiva Raj. Vedic Dharma in its original form; Self-published: Kathmandu, 1988. [Written in Nepali]
4. Adhikari, Navayauvana dasa. Lessons from the Ayurveda; New Jaipur Press: Washington, 1978.
5. Adhikari, R.K. Trends in Nutritional Status in Nepal since 1975; UNICEF: Kathmandu, 1971.
6. Agarwal, R.S. (Dr). Secrets of Indian Medicine; School for Perfect Eyesight, Sri Aurobindo Ashram: Pondicherry, 1971.
7. Alcorn, Janis B. "Ethnobotanical Knowledge Systems: resource for Meeting Rural Development Goals" In Indigenous Knowledge Systems: The Cultural Dimension of Development; D.M. Warren; David Brokensha; L. Jan Slikkerveer, Eds.; Intermediate Technology Publications: London, 1994 (forthcoming)
8. Alliband, Terry. Catalysts of development: voluntary agencies in India; Kumarian Press: West Hartford, 1983.
9. Altieri, M. "Why Study Traditional Agriculture?" In Agroecology; C.R. Carroll; J.H. Vandermeer; P. Roset, Ed.; McGraw Hill: New York, 1990.
10. Amanor, Kojo S. "Managing the Fallow: Weeding Technology and Environmental Knowledge in the Krobo District of Ghana". Agriculture and Human Values Winter-Spring 1991, VIII (1/2), 5-13.
11. Anderson, Mary M. Festivals of Nepal; CENAS: Kathmandu, 1976.
12. Agricultural Projects Service Centre. Nepal: Trained Manpower for the Agriculture Sector; APROSC: Kathmandu, July 1981.
13. Argyris, Chris; Schon, Donald A. theory in practice: increasing professional effectiveness; Jossey-Bass: San Francisco, 1987.

14. Arizpe, Lourdes. "Culture in International Development". Development 1988, 1, 17-19.
15. Ary, D.; Jacobs, L.; Razavieh, A. Introduction to Research in Education, 4th ed.; Holt, Rinehart & Winston: New York, 1990.
16. Ascher, Marcia; Ascher, Robert. "Ethnomathematics". Hist. Sci 1986, XXIV, 125-144.
17. Atte, Oluwayomi David. "Indigenous Knowledge and Local Level Development: The Participatory Approach". Presented at the International Symposium on Indigenous Knowledge and Sustainable Development, IIRR, Silang, Cavite, Philippines, 20-26 September, 1992.
18. Bajaj, J.K.; Mukundan T.M. "Leaves from Thondaimandalam" Series of articles published in The Hindu, Madras, April 28, May 12, May 26, June 9, June 30, July 28, 1991.
19. Bardach, Eugene. The Implementation Game; MIT Press: Cambridge, 1977.
20. Bardhan, P. The Political Economy of Development in India; Blackwell: Oxford, 1984.
21. Basham, A.L. The Wonder that was India; Sidgwick & Jackson: London, 1967.
22. Bates, Robert H. Markets and States in Tropical Africa: The Political Basis of Agricultural Policies; University of California Press: Berkeley, 1981.
23. Baxi, Upendra. People's Law, Development, Justice; Institut fur Internationale Angelegenheiten der Universitat Hamburg, 1979.
24. Bebbington, Anthony. Searching for an "Indigenous" Agricultural Development: Indian Organizations and NGOs in the Central Andes of Ecuador; Centre of Latin American Studies: Cambridge, 1992.
25. Beck, Robert. Perspectives in Philosophy; Holt, Rinehart & Winston: New York, 1924.
26. Bell, Martin. The Exploitation of Indigenous Knowledge or the Indigenous Exploitation of Knowledge: Whose Use of What for What?; Institute for Development Studies: Sussex, 1989.
27. Ben-Horin, Meir. "Jewish Education" In Selected Readings in the Philosophy of

- Education, 3rd ed.; Joe Park (Ed.); Macmillan: New York, 1968.
28. Berger, Peter L. Pyramids of Sacrifice: political ethics and social change; Basic Books: New York, 1975.
 29. Berger, P.L.; Neuhaus R.J. To empower people: the role of mediating structures in public policy; American Institute for Public Policy Research: Washington D.C., 1977.
 30. Berkes, Fikret; George, P.; Preston, R.; Turner, J.; The Cree View of Land and Resources: Indigenous Ecological Knowledge; TASO Report, Second Series, No.8, McMaster University: Ontario, 1992.
 31. Berkes, Fikret; Folke, Carl; Gadgil, Madhav. Indigenous Knowledge for Biodiversity Conservation; unpublished draft, Natural Resources Institute: Manitoba, 1992.
 32. Berkes, Fikret. "Traditional Ecological Knowledge in Perspective" In Traditional Ecological Knowledge: Concepts and Cases; J. T. Inglis, Ed.; Canadian Museum of Nature, IDRC: Ottawa, 1993.
 33. Berreman, G.D. "Chipko: Nonviolent Direct Action to save the Himalayas". South Asia Bulletin Fall 1985, V(2).
 34. Beus; Dunlap. "Conflicting Paradigms in Agriculture". Rural Sociology Winter 1990, 55(4).
 35. Bhatt, Ramakrishna M. Varahamihisa's Brhat Samhita: N Delhi, 1967.
 36. Birken, L. "Developmentalism and its Discontents: From Darwin to Foucault and Wallerstein" Annals of Scholarship 1989, 6(2-3).
 37. Blaikie, Piers; Cameron, John; Seddon, David. Nepal in Crisis; Oxford University Press: Delhi, 1982.
 38. Bodeker, Gerard C. Traditional knowledge and modern health care: An analysis of W.H.O.'s training policy in traditional medicine in light of India's experience with Ayurveda. Ed.D. Dissertation, Harvard University, 1989.
 39. Bodeker, Gerard C. Personal communication, Fairfield, Iowa, 1992.
 40. Bodley, John H. Victims of Progress; 3rd ed.; Mayfield Publishing Company: Mountain view, CA, 1990.

41. Bose, D.M.; Sen, S.N.; Subbarayappa, B.V., Eds. A concise history of science in India; Indian National Science Academy: New Delhi, 1971.
42. Brandt, Carol G. Sustaining Traditional Crops of the Zuni Pueblo Indians of West-Central New Mexico: A Harvest for the Local and Global Agricultural Community; Zuni Archeology Program: Pueblo, 1992.
43. Brodhead, T. "NGOs: In One Year, Out the Other?" In "Development Alternatives: The Challenge for NGOs". World Development Autumn 1987, 15.
44. Brokensha, David. "The Measurement of Rural Inequality". Presented at the Annual Meeting of The American Association for the Advancement of Science, Toronto, January 6, 1981.
45. Bryant, Coralie; White, Louise, G. Managing Development in the Third World; Westview: Boulder, CO, 1982.
46. Buvinic, M. "Projects for Women in the Third World: Explaining their Misbehavior" World Development 1986, 14(5).
47. Campbell, M.J. New Technology and Rural Development: The Social Impact; Routledge: New York, 1990.
48. Capra, Fritjof. The Tao of Physics. An Exploration of the Parallels Between Modern Physics and Eastern Mysticism; Shambhala: Boston, 1985.
49. Cashman, Kristin. "Systems of Knowledge as Systems of Domination: The Limitations of Established Meaning" Agriculture and Human Values Winter-Spring 1991, VIII(1/2), 49-58.
50. Castillo, C.T. Sustainable Agriculture: In Concept and In Deed Paper No. 36; Agricultural Administration (Research and Extension) Network; ODI: London, December 1992.
51. Clarkson, Linda. Our responsibility to the Seventh Generation: Indigenous Peoples and Sustainable Development; International Institute for Sustainable Development: Ottawa, 1992.
52. Chambers, Robert. Rural Poverty Unperceived: Problems and Remedies; Institute of Development Studies: Brighton, March 1980.
53. Chambers, Robert. Rural Development: Putting the Last First; Longman: London, 1983.

54. Chambers, Robert. Poverty in India: Concepts, Research and Reality, an exploration; Institute of Development Studies: Brighton, 22 July 1986.
55. Chambers, Robert. "Problems of Paradigms" In Reaching the Unreached: Biotechnology in Agriculture, A Dialogue; M.S. Swaminathan, Ed.; MacMillan India Ltd., 1991; 246-263.
56. Chambers, Robert. Methods For Analysis by Farmers: The Professional Challenge; Presented at the 1991-92 Symposium of the Association for Farming Systems Research/Extension, Michigan State University, 11 September, 1992.
57. Chambers, Robert. Rural Appraisal: Rapid, Relaxed and Participatory; IDS Discussion Paper 311; Institute of Development Studies: Brighton, October 1992.
58. Chambers, Robert. Personal communication, May 1993.
59. Cheema, G. Shabbir; Rondinelli, Dennis, A. (Eds.). Decentralization and Development: Policy Implementation in Developing Countries; Sage: Beverly Hills, CA, 1983.
60. Cipolla, Rosemary. Letter to Editor; Holistic Education Review, Spring 1990, p.2.
61. Cleveland, David A. "Is Variety More than the Spice of Life? Diversity, Stability and Sustainable Agriculture". Culture and Agriculture Winter/Spring 1993, Nos. 45-46.
62. Colorado, P. "Bridging native and western science". Convergence 1988, 21, 49-70.
63. Dabbs, J.M. "Making Things Visible" In Varieties of qualitative research; J. Van Maanen; J.M. Dabbs; R.R. Faulkner, Eds.; Sage: Beverly Hills, CA, 1982.
64. D'Ambrosio, Ubiratan. "A Methodology for Ethnoscience: The Need for Alternative Epistemologies"; Theoria Segunda Epoca 1985, I(2), 397-409.
65. Dharampal. Indian Science and Technology in the Eighteenth Century; Impex: Delhi, 1971.
66. Dharampal. Productivity of Indian Agriculture in Historical Perspective; unpublished paper: Madras, February 1990.
67. Dias, Clarence J.; Paul, J.C.N. "Developing Legal resources for Participatory

- Organizations of the Rural Poor", Third World Legal Studies; International Third World Legal Studies Association: Valparaiso University School of Law, 1985.
68. Doorneward, Joanne. Religious Role of Trees and Forests in South and South East Asia; BOS Document No. 15: Wageningen, 1992.
 69. Doubleday, Nancy. "Finding Common Ground: Natural Law and Collective Wisdom" In Traditional Ecological Knowledge: Concepts and Cases; J. T. Inglis, Ed.; Canadian Museum of Nature, IDRC: Ottawa, 1993, pp.41-54.
 70. Durning, Alan Thein. Guardians of the Land: Indigenous Peoples and the Health of the Earth; World Watch Paper 112, World Watch Institute: Washington D.C., December 1992.
 71. Eckaus, R.S. "Appropriate technology: the movement has only a few clothes on", Issues in Science and Technology, 1987, 3(2), 62-70.
 72. Esteva, Gustav. "Development: the modernization of poverty". Panoscope November 1991, No. 27, p.28.
 73. Everett, Yvonne. "Forest Gardens of Highland Sri Lanka: An Indigenous System for Reclaiming Deforested Land" In Indigenous Knowledge Systems: The Cultural Dimension of Development; D.M. Warren; David Brokensha; L. Jan Slikkerveer, Eds.; Intermediate Technology Publications: London, 1994 (forthcoming)
 74. Fernandez; Vasquez. In Farming for the Future: An introduction to Low-External-Input and Sustainable Agriculture; Coen Reijntjes; Bertus Haverkort; Ann Waters-Bayer, Eds.; ILEIA/MacMillan, 1992.
 75. Fields, Les. "Tools for Indigenous Agricultural Development in Latin America: An Anthropologist's Perspective". Agriculture and Human Values Winter-Spring 1991, VIII (1/2), 85-92.
 76. Fisher, R. J. Indigenous Systems of Common Property Forest Management in Nepal; Working Paper No. 18, Environmental Policy Institute, East-West Center: Honolulu, December 1989.
 77. Fisher, R.J. Community Organizations and Government Bureaucracies in Social Forestry; Working Paper No. 22, Environmental Policy Institute, East-West Center: Honolulu, May 1990.
 78. Flora, Cornelia Butler. "reconstructing Agriculture: The Case for Local Knowledge" Rural Sociology Spring 1992, 57(1), 92-97.

79. Foster, George, M. Peasant Society and the Image of the Limited Good" In Peasant Society: A Reader; Potter, J.M. et al.; Eds.; 1967; pp 296-321.
80. Foucault, Michel. The Foucault Reader; Pantheon: New York, 1984.
81. Francis, Charles. "Future dimensions of sustainable agriculture" In Sustainable agriculture in temperate zones; Charles A. Francis; Cornelia Butler Flora; Larry D. King, Eds.; John Wiley & Sons: New York, 1990; pp 439-466.
82. Freire, Paulo. Pedagogy of the Oppressed; Penguin: New York, 1972.
83. Fujisaka, Sam. "Incorporating Farmer's Knowledge in International Rice Research" In Indigenous Knowledge Systems: The Cultural Dimension of Development; D.M. Warren; David Brokensha; L. Jan Slikkerveer, Eds.; Intermediate Technology Publications: London, 1994 (forthcoming).
84. Gamwell, Franklin I. Beyond Preference: Liberal Theories of Independent Associations; University of Chicago Press, 1984.
85. Gandhi Peace Foundation. Voluntary Efforts for Rural Development; Gandhi Peace Foundation: New Delhi, 1977.
86. George, Shanti. "Nomadic Cattle Breeders and Dairy Policy in India" Nomadic Peoples September 1985, No. 19.
87. Germain, Gilbert G. A Discourse on Disenchantment: Reflections on Politics and Technology; State University of New York Press: Albany, 1993.
88. Gill, J.G. OK The Data's Lousy, But It's All We've Got (Being a Critique of Conventional Methods); IIED Gatekeeper Series, No. 38, IIED: London, 1993.
89. Gittell, Marilyn. Limits to Citizen Participation: The Decline of Community Organizations; Sage: Beverly Hills, CA, 1980.
90. Goldman, Richard. Personal communication; Harvard Institute of International Development, Cambridge MA, 1986.
91. Goonatilake, S. "Epistemology and Ideology in Science, Technology and Development" In Science, Technology and Development; A. Wad et al., Eds.; Westview: Boulder, CO, 1988; pp 93-114.
92. Gore, Albert. Earth in the balance: ecology and the human spirit; Houghton Mifflin: Boston, 1992.

93. Gray, Andrew. Between the spice of life and the melting pot: Biodiversity conservation and its impact on Indigenous Peoples; IWGIA Document No. 70; IWGIA: Copenhagen, 1991.
94. Gupta, Anil, K. "Survey of Innovations for Sustainable Development: Do Methods Matter?" Presented at the International Symposium on Indigenous Knowledge and Sustainable Development, IIRR, Silang, Cavite, Philippines, 20-26 September, 1992.
95. Gupta, Anil K.; Ura, Karma; Blending Cultural Values, Indigenous Technology and Environment: The Experience of Bhutan; Working Paper No. 883; Indian Institute of Management: Ahmedabad, August 1990.
96. Hardesty, D.L. Ecological Anthropology; Wiley: New York, 1977.
97. Harding, Sandra. Whose Science? Whose Knowledge? Thinking from Women's Lives; Cornell University Press: Ithaca, 1991.
98. Hathaway, Daniela Rommel. Surupalas Vrikshya Veda: 1992.
99. Haverkort, Bertus. "Agricultural Development with a Focus on Local Resources: ILEIA's view of Indigenous Knowledge" In Indigenous Knowledge Systems: The Cultural Dimension of Development; D.M. Warren; David Brokensha; L. Jan Slikkerveer, Eds.; Intermediate Technology Publications: London, 1994 (forthcoming).
100. Hawken, Paul. the magic of findhorn; Harper and Row: New York, 1975.
101. Henry, P.M. "Economic development, progress and culture", Development 1981, 23(3/4), 17-25.
102. Hillel, Daniel J. Out of the Earth: Civilization and the Life of the Soil; The Free Press: New York, 1991.
103. His Majesty's Government of Nepal, Ministry of Law and Justice. The Constitution of Nepal; HMG Press: Kathmandu, 1991.
104. His Majesty's Government of Nepal, Ministry of Law and Justice. Muluki Ain (The Law of the Land); 7th ed.; HMG Press: Kathmandu, 1984.
105. His Majesty's Government of Nepal, National Planning Commission. The Eighth Plan 1992-1997 (Nepali); HMG Press: Kathmandu, Nov. 1991.

106. His Majesty's Government of Nepal, National Planning Commission. The Seventh Plan 1985-1990; HMG Press: Kathmandu, 1985.
107. His Majesty's Government of Nepal, National Planning Commission. Statistical Pocket Book, Central Bureau of Statistics: Kathmandu, 1990.
108. His Majesty's Government of Nepal, National Planning Commission. Population Census; HMG Press: Kathmandu, 1991.
109. His Majesty's Government of Nepal, Ministry of Finance. Economic Survey, Fiscal Year 1986-87.
110. His Majesty's Government of Nepal, Ministry of Agriculture. Agricultural Indicators of Nepal, Agricultural Statistics Division: Lalitpur, 1992.
111. Hobart, M. "Introduction: the growth of ignorance" In An Anthropological critique of development: the growth of ignorance; M. Hobart; Routledge: London, September 1993.
112. Hollander, A.N.J. "Science, technology, modernization, and social change" In The social implications of the scientific and technological revolution; UNESCO: Paris, 1981.
113. Hollinger, Robert. Postmodernism in the social sciences: A thematic approach; draft submitted for publication, 1993.
114. Hopkins, Thomas J. The Hindu Religious Tradition; Wadsworth: Belmont, CA, 1971.
115. Howes, Michael; Chambers, Robert. "Indigenous Technical Knowledge: Analysis, Implications and Issues" In Indigenous Knowledge Systems and Development; D.W. Brokensha; D.M. Warren; Oswald Werner, Eds.; University Press of America: Lanham MD, 1980.
116. Huntingdon, Gertrude E. "Ideology, History and Agriculture: Examples from Contemporary North America", Culture and Agriculture Winter/Spring 1993, Nos. 45-46.
117. Hyden, Goran. No Shortcuts to Progress: African Development Management in Perspective; University of California Press: Berkeley, 1983.
118. Hyndman, David. "Ancient Futures for Indigenous People: Cultural and Biological Diversity Through Self-Determination" Presented at the International Symposium

on Indigenous Knowledge and Sustainable Development, IIRR, Silang, Cavite, Philippines, 20-26 September, 1992.

119. Ingersoll, Jasper. "Social Analysis in AID and the World Bank" In Methods for Social Analysis in Developing Countries; Kurt Finsterbusch; J. Ingersoll; L Llewellyn, Eds.; Westview: Boulder, CO, 1990.
120. Inglis, Julian. Traditional Ecological Knowledge: Concepts and Cases; Canadian Museum of Nature, IDRC: Ottawa, 1993.
121. Institute for Indigenous Theory and Practice. Bulletin E12.2; IITP: Cape Town, May 1993.
122. Integrated Development Systems. "Foreign Aid and Development in Nepal", Proceedings of a Seminar, Kathmandu; IDS: Kathmandu, October 4-5, 1983.
123. IUCN. Tradition, Conservation, and Development; Occasional Newsletter of the Commission on Ecology's Working Group on Traditional Ecological Knowledge No. 4; IUCN, Gland, Switzerland, 1986. Cited in Berkes, Fikret, 1993 [32].
124. IUCN/UNEP/WWF. Caring for the Earth: A Strategy for Sustainable Living; IUCN/UNEP/WWF: Gland, Switzerland, 1991.
125. Jackson, Wes. Documentary; Iowa Public Television: Des Moines, May 1993.
126. Jaggi, O.P. Scientists of Ancient India; Atma Ram and Sons: Delhi, 1966.
127. Jaggi, O.P. Dawn of Indian Science (Vedic and Upanishadic Period); Atma Ram and Sons: Delhi, 1969.
128. Jamison, A. "Innovation Theories and Science and Technology Policy: Historical Perspectives" In Science, Technology and Development; A. Wad et al., Eds.; Westview: Boulder, CO, 1988.
129. Jenkins, J. Craig. "Non Profit Organizations and Policy Advocacy" In The Nonprofit Sector: A Research Handbook; Walter W. Powell, Ed.; Yale University Press: New Haven, 1987.
130. Jha, Hit Narayan. The Licchavis; Tribhuvan University Press: Kathmandu, 1978, Ch.III, pp 51-53.
131. Johannes, R.E. "Integrating Traditional Ecological Knowledge and Management with Environmental Impact Assessment" In Traditional Ecological Knowledge:

- Concepts and Cases; J. T. Inglis, Ed.; Canadian Museum of Nature, IDRC: Ottawa, 1993, p.35.
132. Johnson, Clive, Ed.. Vedanta; Harper and Row Publishers: New York, 1971.
 133. Johnston, Bruce; Clark, William. Redesigning Rural Development: A Strategic Perspective; Johns Hopkins University Press: Baltimore, 1982.
 134. Kahler, Alan. Professor of Agricultural Education. Personal communication; Iowa State University: Ames, IA, 1992.
 135. Kautilya. The Arthasastra, In "Two Studies in the Arthasastra of Kautilya"; E.H. Johnson; Journal of the Royal Asiatic Society: London, 1929, 77-102.
 136. Khatri, Tek B. Fairs and Festivals of Nepal; HMG Press: Kathmandu, 1982.
 137. Kibben, Jaime; Bartz, Steve. In Good Hands: Sustainable Agriculture in the Lacandon Rainforest; Video proposal, San Francisco, CA, Feb 5, 1993.
 138. Kimball, Linda, A. "Brunei Malay Traditional Ethno-Veterinary Practice" Borneo Research Bulletin September 1985, 17(2), 123-150.
 139. Kirschenman, Fred. Personal communication; Ames IA, 1993.
 140. Kleymeyer, Charles D. "Cultural Energy and Grassroots Development" Grassroots Development 1992, 16(1), 22-31.
 141. Kloppenberg, Jack Jr. "Social Theory and the De/Reconstruction of Agricultural Science: Local Knowledge for an Alternative Agriculture" Rural Sociology 1991, 56(4), 519-548.
 142. Kloppenberg, Jack Jr. "Science in Agriculture: A Reply to Molnar, Duffy, Cummins, and Van Santen and to Flora" Rural Sociology 1992, 57(1), 98-107.
 143. Koepf, Herbert H. Personal communication; Michael Fields Agricultural Institute, East Troy, WI, March 1993.
 144. Korten, David C.; Klaus, Rudi. People-Centered Development: Contributions toward Theory and Planning Frameworks; Kumarian Press: West Hartford, 1984.
 145. Korten, D.C. "Third Generation NGO Strategies: A Key to People-Centered Development" In Development Alternatives: The Challenge for NGOs; Special Issue of World Development Autumn 1987, Vol 15.

146. Kothari, Rajni. "The Non Party Political Process" Economic and Political Weekly Feb 4, 1984.
147. Kuznets, Simon. Economic Growth and Structure; W.W. Norton: New York, 1965.
148. Kuznets, Simon. "Economic Growth and Income Inequality" The American Economic review March 1955, XLV(1).
149. Lalonde, Andrew. "African Indigenous Knowledge and its Relevance to Sustainable Development" In Traditional Ecological Knowledge: Concepts and Cases; J. T. Inglis, Ed.; Canadian Museum of Nature, IDRC: Ottawa, 1993, pp55-61.
150. Land Institute, The. Prairie festival 1993, Salina, Kansas. Citing Chief Luther Standing bear.
151. Lansing, J. Stephen; Kremer, James. N. "A Socio-Ecological Analysis of Balinese Water Temples" In Indigenous Knowledge Systems: The Cultural Dimension of Development; D.M. Warren; David Brokensha; L. Jan Slikkerveer, Eds.; Intermediate Technology Publications: London, 1994 (forthcoming).
152. LeMee, Jean. Hymns from the Rigveda; Alfred A Knopf Inc: New York, 1975.
153. Lindblom, Charles E. Politics and markets: The World's Political-Economic Systems; Basic Books: New York, 1977.
154. Lovelock, James. The Ages of Gaia: A Biography of Our Living Earth; Norton: new York, 1988.
155. Macy, Joanna. Dharma and development: religion as a resource in the Sarvodaya self help movement; Kumarian Press: West Hartford, 1985.
156. Mahesh Yogi, Maharishi. Maharishi Mahesh Yogi on the Bhagavad-Gita; Penguin: Reading, UK, 1967.
157. Mahesh Yogi, Maharishi. In Celebrating the dawn: Maharishi Mahesh Yogi and the TM technique; Bob Oates; Putnam: New York, 1976.
158. Mahesh Yogi, Maharishi. "The Role of Culture" In Enlightenment to Every Individual, Invincibility to Every Nation; Maharishi Mahesh Yogi; Maharishi European Research University Press, 1978.

159. Mahesh Yogi, Maharishi. Life Supported by Natural Law; MIU Press: Fairfield, IA, 1986.
160. Majumdar, G.P. Vanaspati; University of Calcutta, 1927. Cited in Jaggi, 1966 [126].
161. Mathias-Mundy, Evelyn. Proceedings of the International Symposium on "Indigenous Knowledge and Sustainable Development", IIRR, Silang, Cavite, Philippines; published in Indigenous Knowledge and Development Monitor 1993, 1(2).
162. Mathias-Mundy, Evelyn et al. Indigenous Technical Knowledge of Private Tree Management: A Bibliographic Report; Bibliographies in technology and Social Change No. 7; Technology and Social Change Program, Iowa State University, Ames, IA, 1992.
163. Mathias-Mundy, Evelyn; McCorkle, Constance. "Ethno-veterinary Medicine and development: A review of the Literature" In Indigenous Knowledge Systems: The Cultural Dimension of Development; D.M. Warren; David Brokensha; L. Jan Slikkerveer, Eds.; Intermediate Technology Publications: London, 1994 (forthcoming).
164. Mazur, Robert E. "Linking Popular Initiative and Aid Agencies: The Case of Refugees". Development and Change 1987, 18, 437-461.
165. Mazur, Robert. Personal communication; Ames, IA, 1992.
166. Mazur, Robert; Titilola, S. Tunji. "Social and Economic Dimensions of Local Knowledge Systems in African Sustainable Agriculture" Sociologia Ruralis 1992, XXXII(2/3).
167. Meehan, Peter. "Science, Ethnoscience, and Agricultural Knowledge Utilization" In Indigenous Knowledge Systems and Development; D.W. Brokensha; D.M. Warren; Oswald Werner, Eds.; University Press of America: Lanham MD, 1980.
168. Merchant, Carolyn. The Death of Nature: Women, Ecology and the Scientific Revolution; Harper and Row: New York, 1980.
169. Miller, Jeanine. The vision of cosmic order in the Vedas; Routledge and Kegan Paul: London, 1985.
170. Miller, Ron. "The Heart of Holistic Education" Holistic Education review Winter 1990, p2.

171. Miller, Ron. "Education and the New Society" Holistic Education review Spring 1991, p2.
172. Moles, Jerry; Riker, James V. "Hope, Ideas, and Our only Alternative -- Ourselves and Our Values: National Heritage and the Future of Sri Lankan Agriculture" In Agricultural Sustainability in a Changing World Order; Gordon K. Douglass, Ed.; Westview: Boulder, CO, 1984.
173. Mollinson, Bill. Permaculture: a practical guide for a sustainable future; Island Press: Washington D.C, 1990.
174. Montgomery, J.D. Personal communication; Kennedy School of Government, Harvard University, 1986.
175. Morris, William, (Ed). The American Heritage Dictionary of the English language; Houghton Mifflin Co: Boston, 1981.
176. Muchena, Olivia. PhD. Dissertation, Iowa State University, 1990.
177. Mundy, Paul; Compton, Lin. "Indigenous Communication and Indigenous Knowledge" In Indigenous Knowledge Systems: The Cultural Dimension of Development; D.M. Warren; David Brokensha; L. Jan Slikkerveer, Eds.; Intermediate Technology Publications: London, 1994 (forthcoming).
178. Myrdal, Gunnar. Asian Drama: An Inquiry into the Poverty of Nations; Pantheon: New York, 1968.
179. Naples, Nancy. Personal communication; Ames, Iowa, 1992.
180. Newsweek. "The Electronic Goddess"; Newsweek March 6, 1989.
181. National Institute of Health. Alternative Medicine, Wellness, & health Care Reform: Preparing for a Sustainable Future; NIH Office of Alternative Medicine, May 20-23, 1993.
182. Obeyesekere, Gananath. Rationality, Theory, and Experimentation in Ayurvedic Medicine; United Nations University Project on Socio-Cultural Development in a Changing World: Tokyo, 1980.
183. Obomsawin, Raymond. "Culture: Today's Great Unanswered Issue in Development" Presented at the International Symposium on Indigenous Knowledge and Sustainable Development, IIRR, Silang, Cavite, Philippines, 20-26 September, 1992.

184. O'Brien, William E.; Flora, Cornelia Butler. "Selling Appropriate Development vs Selling-Out Rural Communities: Empowerment and Control in Indigenous Knowledge Discourse" Agriculture and Human Values, Spring 1992, pp95-102.
185. Okun, Arthur M. Equality and Efficiency: the Big TradeOff; Brookings Institute: Washington D.C., 1975.
186. Opoku, Kofi Asare. West African Traditional religion; FEP International Pvt Ltd: Lagos, 1978.
187. Orme-Johnson, David. Director, Institute of World Peace, Maharishi International University. Personal communication, February 1993.
188. Osborn, Fairfield. "Introduction" In The Web of Life; John H. Storer; Signet: New York, 1953,
189. Osei-Hwedie, Kwaku. "Putting the 'Social' Back into 'Work': The case for the indigenization of social work practice and education in Africa"; Institute for Indigenous Theory and Practice. Bulletin E12.2; IITP: Cape Town, May 1993.
190. Pandey, Shashi. "Role of voluntary action in rural India" South Asia Bulletin 1984, 4, 38-47.
191. Panikker, 1980. Cited in Miller, Jeanine. The vision of cosmic order in the Vedas; Routledge and Kegan Paul: London, 1985 [169].
192. Panoscope. "Oral history: taking time to listen", No. 27, PANOS Institute: London, Nov 1991.
193. Park, Joe. Selected Readings in the Philosophy of Education, 3rd ed.; Macmillan: New York, 1968.
194. Patanjali. Cited in Acharya, Shiva Raj. Vedic Dharma in its original form; Self-published, Kathmandu, 1988. [Written in Nepali] [3].
195. Paul, James C.N.; Dias, Clarence J. "Contrasting Paradigms: State-Managed Development vs Alternative People-Managed Development" In Law in Alternative Strategies of Rural Development; Third World Legal Studies, International Third World Legal Studies Association, International Center for law in Development: New York, 1992.
196. Paul, James C.N.; Dias, Clarence J. "Developing Human Rights for Human-Needs-Centered Development" Hunger Notes October-November 1986, XII(5-6).

197. Pereira, Winin; Seabrook, Jeremy. Asking the Earth: farms, Forestry, and Survival in India; Earthscan Publications: London, 1990.
198. Pinch, T.J.; Bijker, W.E. "The social construction of facts and artifacts: or how the sociology of science and sociology of technology might benefit each other" In The Social Construction of Technology Systems: New Directions in the Sociology and History of Technology; MIT Press: Cambridge MA, 1987, pp17-50.
199. Piven, Frances Fox; Cloward, Richard A. Regulating the Poor: The Functions of Public Welfare; Pantheon Books: New York, 1971.
200. Pokhrel, Chhabilal. Dharma and sects since the Vedas (in Nepali); Gourishankar Press: Vanaras, 1983.
201. Pokhrel, Chhabilal. Personal communication, 1993.
202. Pokhrel, Durga. EdD. Dissertation, Harvard University, 1993.
203. Pokhrel, Durga; Willett, Anthony. Shadow Over Shangri-La: A Woman's Quest for Freedom in Nepal; submitted for publication, 1993.
204. Polyani, Karl. The Great Transformation: the political and economic origins of our times; Beacon: Boston, 1944.
205. Popkin, Samuel. The Rational Peasant; University of California Press: Berkeley, 1979.
206. Portland Earth and Spirit Council. Earth and Spirit Nov-Dec 1992 I(5).
207. Posey, D.A. "Indigenous knowledge and development: an ideological bridge to the future" Ciencia & Culture 1982, 35(7), 877-894.
208. Posey, D.A. "Ethnobiology: Implications and Applications" In Proceedings of the First International Congress of Ethnobiology, Belem, Brazil, 1990.
209. Posey, D.A. "International Property Rights". Journal of Ethnobiology 1990, 10, 93-98.
210. Pretty, Jules N. "Farmers' Extension Practice and Technology Adaptation: Agricultural Revolution in 17-19th Century Britain" Agriculture and Human Values Winter-Spring 1991, VIII (1/2).
211. Pretty, Jules. Personal communication; London, May 1993.

212. Raghavan, Dr. V. The Indian Heritage; Indian Institute of World Culture: Delhi, 1963.
213. Rajasekaran, Bhaktavatsalam. PhD. Dissertation, Iowa State University, 1992.
214. Rau, Bill. From feast to Famine: Official cures and grassroots remedies to Africa's food crisis; Zed, London and New Jersey, 1991.
215. Redfield, Robert. The Little Community and Peasant Society and Culture; Phoenix Books: Chicago, 1965.
216. Reichel, Elizabeth. "Shamanistic Modes for Environmental Accounting in the Colombian Amazon: Lessons from Indigenous Ethno-Ecology for Sustainable Development" Presented at the International Symposium on Indigenous Knowledge and Sustainable Development, IIRR, Silang, Cavite, Philippines, 20-26 September, 1992.
217. Reijntjes, Coen; haverkort, Bertus; Waters-Bayer, Ann, Eds. Farming for the Future: An introduction to Low-External-Input and Sustainable Agriculture; ILEIA/MacMillan, 1992.
218. Rhoda, Richard E. Development Activities and Rural-Urban Migration. Is It Possible to Keep them Down on the Farm? AID Office of Urban Development, Bureau for Development Support: Washington D.C., 1979.
219. Richards, Paul. Indigenous Agricultural Revolution: Ecology and food production in West Africa; Westview: Boulder, CO, 1985.
220. Robertson, A.F. People and the State: An Anthropology of Planned Development; Cambridge University Press: Cambridge, England, 1984.
221. Rocheleau, Dianne E. "Gender, resource management and the rural landscape: Implications for agroforestry and farming systems research," In Gender Issues in Farming Systems Research and Extension; S.V. Poats; M. Schmink; A. Spring, Eds.; Westview: Boulder, CO, 1988.
222. Roddick, Anita. Body and Soul; Vermillion: London, 1992.
223. Rostow, W.W. The Stages of Economic Growth: A Non-Communist Manifesto; Cambridge University Press: Cambridge, England, 1961.
224. Ruddle, K.; Hviding, E.; Johannes, R.E. "Marine Resource Management in the Context of Customary Tenure" Marine Resource Economics 1992, 7, 429-273.

225. Ruddle, K. "The Transmission of Traditional Ecological Knowledge" In Traditional Ecological Knowledge: Concepts and Cases; J. T. Inglis, Ed.; Canadian Museum of Nature, IDRC: Ottawa, 1993, pp17-31.
 226. Ruttan, V.W. "IRD Programmes: A Historical Perspective" World Development 1984, 12(4),393-401.
 227. Ruttan, Vernon W. "Cultural Endowments in Economic Development: What Can We Learn from Anthropology?" Economic Development and Culture Change 1988, 36(3).
 228. Sachs, Wolfgang, ed. The Development Dictionary: A Guide to Knowledge as Power; Zed Books Ltd: London and New Jersey, 1992.
 229. Sahlins, Marshall. Culture and Practical reason; University of Chicago Press, 1976.
 230. Santucci, James A. An outline of Vedic literature; Scholars Press: Missoula, Montana, 1976.
 231. Saravia, Gustavo. "A breath of life: revitalizing farmers' knowledge" Forests Trees and People Newsletter No. 18, 1992.
 232. Sarkar, Benoy K. Hindu Achievements in Exact Science; Longman, Green and Co:New York, 1918.
 233. Schultze, C.L. The public use of private interest; Brookings: Washington D.C., 1977.
 234. Schuster, Don. Personal communication; Ames, Iowa, 1992.
 235. Scoones, Ian; Thompson, John. "Beyond Farmer First. Rural People's Knowledge, Agricultural Resources, and Extension Practice: Towards a Theoretical Framework", Presented at IIED/IDS Beyond Farmer First Conference, Brighton, England, 27-29 October, 1992.
 236. Scott, James C. The Moral Economy of the Peasant: Rebellion and Subsistence in South East Asia; Yale University Press: New Haven, 1976.
 237. Seddon, David. Nepal: A State of Poverty; Vikas Publishing House Pvt Ltd: New Delhi, 1987.
 238. Serageldin, Ismail. "Culture, Empowerment, and the Development Paradigm"
-

Development 1991,1.

239. Sethi, Harsh. "Groups in a New Politics of Transformation" Economic and Political Weekly, Feb 18, 1984.
240. Shaull, Richard. "Introduction" In Pedagogy of the Oppressed; Paulo Freire; Penguin, 1972. [82]
241. Shiva, Vandana. The Violence of the Green Revolution: Third World Agriculture, Ecology, and Politics; Zed: London and New Jersey, 1991.
242. Sibley, Willis E. "Global Change and Changing Opportunities for Anthropology: A Participant Observer's View" Central Issues in Anthropology 1992, X.
243. Simpson, James R. "Identification of Goals and Strategies in Designing Technological Change for Developing Countries" In Transferring Food Production Technology to Developing Nations: Economic and Social Dimensions; J.J. Molnar; H.A. Clonts, eds.; Westview: Boulder, CO, 1983.
244. Sosin, Michael. "Social Problems Covered by Private Agencies: An Application of Niche Theory" Social Services Review March 1985, 59(1), p75.
245. Spooner, B. "Insiders and outsiders in Baluchistan: Western and indigenous perspectives on ecology and development" In Lands at Risk in the Third World: Local Level Perspectives; P.D. Little; M.M. Horowitz, eds.; Westview: Boulder, CO, 1987.
246. Spretnak, Charlene. "Gaian Spirituality" Woman of power, Issue 20, 1991.
247. Staudt, Kathleen A. "Tracing Sex Differentiation in Donor Agricultural Programs", American Political Science Association, Washington D.C., 1979.
248. Stevens, William K. "Shamans and Scientists Seek Cures in Plants", New York Times, January 28, 1992.
249. Stewart, F. "The case for appropriate technology: a reply to R.S. Eckaus" Issues in Science and Technology 1987, 3(4), 101-109.
250. Stewart, Frances. "Technology Transfer for Development" In Science and Technology: Lessons for Development Policy; R.E. Evenson; G. Ranis, eds.; Westview: Boulder CO, 1990.
251. Storer, John H. The Web of Life; Signet: New York, 1953.

252. Stowe, Robert. Personal communication; Maharishi International University, Fairfield, Iowa, 1993.
253. Swaminathan, M.S. (ed). Reaching the Unreached: Biotechnology in Agriculture. A Dialogue; MacMillan India Ltd., 1991.
254. Taylor, Charles. Philosophy and the Human Sciences: Philosophical Papers 2; Cambridge University Press: Cambridge, England, 1985.
255. Tendler, J. Turning Private Voluntary Organizations into Development Agencies: Questions for Evaluation. USAID Program Evaluation Discussion Paper No. 12, Washington D.C., 1982.
256. Tendler, J. Lecture; MIT, Cambridge, MA, 1987.
257. Thomas, John. Personal communication; Kennedy School of Government: Cambridge, MA, 1986.
258. Thrupp, L.A. "Legitimizing local knowledge: "scientized packages" or empowerment for third world people" In Indigenous Knowledge Systems and Development; D.W. Brokensha; D.M. Warren; Oswald Werner, Eds.; University Press of America: Lanham MD, 1980.
259. Thurston, H. David; Parker, Joanne M. "Raised Beds and Plant Disease Management" In Indigenous Knowledge Systems: The Cultural Dimension of Development; D.M. Warren; David Brokensha; L. Jan Slikkerveer, Eds.; Intermediate Technology Publications: London, 1994 (forthcoming).
260. Timmer, Peter. Harvard Institute for International Development. Personal communication, 1986.
261. Titilola, Dr. S. Tunji. "The Role of Indigenous Knowledge in Rural Development Activities for Sustainable Development in Nigeria," Presented at the International Symposium on Indigenous Knowledge and Sustainable Development, IIRR, Silang, Cavite, Philippines, 20-26 September, 1992.
262. Tull, W. Herman. The Vedic Origin of Karma; State University of New York: Albany, 1989.
263. Turnbull, Colin M. The Lonely African; Simon & Schuster: New York, 1962.
264. Tylor, 1874. Cited in Ascher, 1986. [16].

265. United Nations. Public Administration Institutions and Practices in Integrated Rural Development Programs; UN: New York, 1980, p3. Cited in Paul, Samuel. Managing Development Programs: The Lessons of Success; Westview: Boulder CO, 1982, p2.
266. USAID. Country Development Strategy Statement FY 1986 Nepal; USAID: Washington D.C., January 1984.
267. USAID. Toward Strategic Management; USAID: Washington D.C., December 1990.
268. Vance, Marion Ritchey; Weber, Ron. "Harmony with the Earth: A Celebration of Andean Culture" Grassroots Development 1992, 16(1).
269. Van Asdall, Willard. "Toward a synthesis of knowledge and an expansion of consciousness for healing the earth," In Proceedings of the First International Congress of Ethnobiology, Belem, Brazil, 1990, p35-45.
270. Von Hayek, Friedrich August. "The Pretence of Knowledge," Nobel Memorial Lecture December 11, 1989; The American Economic Review December 1989, 79(6).
271. von Liebenstein, G.W. "Promoting the International IK-Network: The Supportive Role of CIRAN," Presented at the International Symposium on Indigenous Knowledge and Sustainable Development, IIRR, Silang, Cavite, Philippines, 20-26 September, 1992.
272. Walker, Peter. "Indigenous Knowledge and Famine Relief in the Horn of Africa," In Indigenous Knowledge Systems: The Cultural Dimension of Development; D.M. Warren; David Brokensha; L. Jan Slikkerveer, Eds.; Intermediate Technology Publications: London, 1994 (forthcoming).
273. Wallace, Keith. Founding President, Maharishi International University, Fairfield, Iowa. Personal communication, February, 1993.
274. Walzer, M. "Toward a Theory of Social Assignments" In American society: public and private responsibilities; W. Knowlton; R. Zeckhauser, eds.; Ballinger Publishing Co.: Cambridge, Mass., 1986.
275. Warren, D.M. "Indigenous Knowledge Systems for activating local decision-making groups in rural development" In Communication for Group Transformation in Development; Godwin C. Chu et al, eds.; East-West Center, Honolulu, September 1976.

276. Warren, D.M. "Ethnoscience in Rural Development" In Indigenous Knowledge Systems and Development; D.W. Brokensha; D.M. Warren; Oswald Werner, Eds.; University Press of America: Lanham MD, 1980.
277. Warren, D.M. "Ghanaian National Policy Toward Indigenous Healers: The Case of the Primary Health Training For Indigenous Healers (PRHETHI) Program," Soc. Sci. Med. 1982, 16, 1873-1881.
278. Warren, D.M. "Linking Scientific and Indigenous Agricultural Systems" In The Transformation of International Agricultural Research and Development; J. Lin Compton; Lynne Rienner Publishers: Boulder CO, 1989, pp153-170.
279. Warren, D.M. "Akan Arts and Aesthetics: Elements of Change in a Ghanaian Indigenous Knowledge System"; Studies in Technology and Social Change No. 16; Technology & Social Change Program, Iowa State University, Ames, IA, 1990.
280. Warren, D.M. Using Indigenous Knowledge in Agricultural Development; World Bank Discussion Paper No. 127, The World Bank: Washington D.C., 1991.
281. Warren, D.M. "Indigenous Agricultural Knowledge, Technology, and Social Change," Draft chapter dated September 12, 1991 for Sustainable Agriculture in East North America: Lessons from Natural and Human History. Prospects for the Future; Gregory McIsaac et al. eds.; University of Illinois: Champaign. (In preparation)
282. Warren, D.M. Personal communication, 1992.
283. Warren D.M. "A Preliminary Analysis of Indigenous Soil Classification and Management Systems in 4 Ecozones of Nigeria," Discussion Paper RCMD 92/1; IITA: Ibadan, Nigeria, April 1992.
284. Warren, D.M. "Indigenous Knowledge, Conservation of Biodiversity, and Development;" Center for Indigenous Knowledge for Agriculture and Rural Development, Iowa State University, Ames, Iowa. Submitted to TEK Talk: A Newsletter on Traditional Ecological Knowledge, August 26, 1992.
285. Warren, D.M. "Using Indigenous Knowledge for Agriculture and Rural Development: A Concept Paper Exploring the Potential Utility of the Global Network of Indigenous Knowledge Resource Centers for International and National Agricultural research Centers," CIKARD, ISU, Ames, Iowa, September 12, 1992.

286. Warren, D.M. "Indigenous Knowledge and Sustainable Development: A Review of Critical research Areas and Policy Issues," Presented at the International Symposium on Indigenous Knowledge and Sustainable Development, IIRR, Silang, Cavite, Philippines, 20-26 September, 1992.
 287. Warren, D.M.; David Brokensha; L. Jan Slikkerveer, Eds. Indigenous Knowledge Systems: The Cultural Dimension of Development; Intermediate Technology Publications: London, 1994 (forthcoming).
 288. Warwick, Donald P. Bitter Pills: Population Policies and their Implementation in Eight Developing Countries; Cambridge University Press: Cambridge England, 1982.
 289. Wavey, Chief Robert. Keynote Address, Presented at International Workshop on Indigenous Knowledge and Community-based Resource Management, Ottawa, September 1991; published in Traditional Ecological Knowledge: Concepts and Cases; J. T. Inglis, Ed.; Canadian Museum of Nature, IDRC: Ottawa, 1993.
 290. Weber, Max. The Protestant Ethic and the Spirit of Capitalism; Charles Scribner's Sons: New York, 1958.
 291. Weiner, Myron; Huntington, Samuel P. Understanding Political Development; Little Brown & Co: Boston, 1987.
 292. Weinstein, Jay; McIntyre, John R. "Multinational Corporations and the diffusion of world standards: A theoretical exploration," Studies in Comparative International Development, Fall 1986.
 293. Weisbrod, B.A. The nonprofit economy; Harvard University Press: Cambridge, Mass., 1988.
 294. Weiss, Carol. Evaluation Research: Methods of Assessing Program Effectiveness; Prentice Hall: New Jersey, 1972.
 295. Whitehead, Alfred North. Science and the Modern World; Mentor: New York, 1925.
 296. Willett, Anthony. Rainfed Rice Development Project Review Paper; RRDP, Ministry of Agriculture: Zanzibar, February 5, 1990.
 297. Wirth, Danielle. Personal communication; Ames, Iowa, 1993.
 298. Woodley, Ellen. "Indigenous Ecological Knowledge Systems and Development,"
-

Agriculture and Human Values Winter-Spring 1991, VIII (1/2), 173-178.

299. Yoder, Rhonda Lou. Amish Agriculture in Iowa: Indigenous Knowledge for Sustainable Small-Farming Systems, Studies in Technology and Social Change No. 15; TSC Program, Iowa State University, Ames, Iowa, 1990.
300. Zukav, Gary. The Dancing Wu Li Masters: An Overview of the New Physics; William Morrow: New York, 1979.

APPENDIX I
CHAMBERS' ELEMENTS OF NEW PROFESSIONALISM

Professional values and preferences

A For technology, research and projects

<i>First</i>	<i>Last</i>
Urban	Rural
Industrial	Agricultural
High cost	Low cost
Capital-using	Labour-using
Mechanical	Animal or Human
Inorganic	Organic
Complex	Simple
Large	Small
Modern	Traditional
Exotic	Indigenous
Marketed	Subsistence
Quantified	Unquantified
Geometrical	Irregular
Visible and seen	Invisible or unseen
Tidy	Untidy
Predictable	Unpredictable
Hard	Soft
Clean	Dirty
Odourless	Smelly

B For Contacts and Clients

High status	Low status
Rich	Poor
Influential	Powerless
Educated	Illiterate
Male	Female
Adult	Child
Light-skinned	Dark skinned

C For place and time

Urban	Rural
Indoors	Outdoors
Office, laboratory	Field
Accessible	Remote
Day	Night
Dry season	Wet season

Two Modes of Intervention

	<u>Extractive</u>	<u>Enabling</u>
Outsiders' roles in diagnosis	Obtain and analyse data,	Facilitate farmers' own analysis
and with technology	Prescribe and transfer	Search and supply
Farmers are	Passive	Active
Farmers	Provide data Adopt Follow instructions	Observe, analyse Demand Test, experiment
Analysis is by	Us	Them

Verbal and Visual Compared

Some contrasts between the verbal and the visual

	<u>Verbal</u> (interview, conversation)	<u>Visual</u> (diagram)
Outsider's roles	Investigator	Initiator and catalyst
Outsider's mode	Probing	Facilitating
Outsider's interventions	Continuous and maintained	Initial and then reduced
Insider's roles	Respondent	Presenter and analyst
Insider's mode	Reactive	Creative
Insider's awareness of outsider	High	Low
Eye contact	High	Low
The medium and material are those of	Outsider	Insider
The poorer, weaker, and women can be	Marginalised	Empowered
Detail influenced by	Etic categories	Emic perceptions
Information flow	Sequential	Cumulative
Accessibility of information to others	Low and transient	High and semi-permanent
Initiative for checking lies with	Outsider	Insider
Utility for spatial, temporal and causal information, relations, analysis, planning and monitoring	Lower	Higher
Ownership of information	Appropriated by outsider	Owned and shared by insider

APPENDIX II

KEY ELEMENTS OF COMPETING AGRICULTURAL PARADIGMS

Conventional agriculture	Alternative agriculture
Centralization • National/international production, processing, and marketing • Concentrated populations; fewer farmers • Concentrated control of land, resources and capital	Decentralization • More local/regional production, processing, and marketing • Dispersed populations; more farmers • Dispersed control of land, resources and capital
Dependence • Large, capital-intensive production units and technology • Heavy reliance on external sources of energy, inputs, and credit • Consumerism and dependence on the market • Primary emphasis on science, specialists and experts	Independence • Smaller, low-capital production units and technology • Reduced reliance on external sources of energy, inputs, and credit • More personal and community self-sufficiency • Primary emphasis on personal knowledge, skills, and local wisdom
Competition • Lack of cooperation; self-interest • Farm traditions and rural culture outdated • Small rural communities not necessary to agriculture • Farm work a drudgery; labor an input to be minimized • Farming is a business only • Primary emphasis on speed, quantity, and profit.	Community • Increased cooperation • Preservation of farm traditions and rural culture • Small rural communities essential to agriculture • Farm work rewarding; labor an essential to be made meaningful • Farming is a way of life as well as a business • Primary emphasis on permanence, quality, and beauty
Domination of nature • Humans are separate from and superior to nature • Nature consists primarily of resources to be used • Life-cycle incomplete; decay (recycling wastes) neglected • Human-made systems imposed on nature • Production maintained by agricultural chemicals • Highly processed, nutrient-fortified food	Harmony with nature • Humans are part of and subject to nature • Nature is valued primarily for its own sake • Life-cycle complete; growth and decay balanced • Natural ecosystems are imitated • Production maintained by development of healthy soil • Minimally processed, naturally nutritious food
Specialization • Narrow genetic base • Most plants grown in monocultures • Single-cropping in succession • Separation of crops and livestock • Standardized production systems	Diversity • Broad genetic base • More plants grown in polycultures • Multiple crops in complementary rotations • Integration of crops and livestock • Locally adapted production systems

Conventional agriculture	Alternative agriculture
● Highly specialized, reductionistic science and technology Exploitation ● External costs often ignored ● Short-term benefits outweigh long-term consequences ● Based on heavy use of nonrenewable resources ● Great confidence in science and technology ● High consumption to maintain economic growth ● Financial success; busy lifestyles; materialism	● Interdisciplinary, systems-oriented science and technology Restraint ● All external costs must be considered ● Short-term and long-term outcomes equally important ● Based on renewable resources; nonrenewable resources conserved ● Limited confidence in science and technology ● Consumption restrained to benefit future generations ● Self-discovery; simpler lifestyles; nonmaterialism

The representation of the two agricultural paradigms in Table 1 is based on a thorough review of carefully selected literature. The writings (or speeches in the case of Earl Butz) of six prominent proponents of conventional agriculture and six leading proponents of alternative agriculture were reviewed in detail. The conventional agriculturalists selected are Earl Butz, Marion Clawson, Hiram Drache, Earl O. Heady, Wheeler McMillen, and Jamie L. Whitten; the alternative agriculturalists are William Aiken, Wendell Berry, C. Dean Freudenberger, Wes Jackson, Gene Logsdon, and Robert Rodale.⁴

⁴ *Conventional Agriculturalists:* Earl Butz is former Dean of the College of Agriculture at Purdue University and former U.S. Secretary of Agriculture; Marion Clawson is senior fellow emeritus, Resources for the Future, Washington, DC; Hiram Drache owns a cattle feeding operation, is a professor of history at Concordia College, Moorhead, Minnesota, and has written several books about modern, mechanized U.S. agriculture; Earl O. Heady is C. F. Curtiss Distinguished Professor of agriculture and professor emeritus of agricultural economics at Iowa State University; Wheeler McMillen is past editor-in-chief and vice-president of the *Farm Journal*, author of numerous books on U.S. agriculture, and has spoken on the subject throughout the world; Jamie L. Whitten is chairman of the U.S. House of Representatives Committee on Appropriations, and chairman of the Subcommittee on Agriculture and Related Agencies. He is sometimes referred to as the "permanent secretary of agriculture."

Alternative Agriculturalists: William Aiken is associate professor of philosophy at Chatham College in Pittsburgh. His research interests include distributive justice and environmental ethics as they relate to agriculture; Wendell Berry is a small farmer, poet, essayist, and professor of English at the University of Kentucky; C. Dean Freudenberger is an agronomist and professor of international development studies, missions, and rural church at the School of Theology, Claremont, California; Wes Jackson is a geneticist by training and operates the Land Institute in Salina, Kansas; Gene Logsdon operates a small traditional farm in Ohio and is a journalist for the Rodale Press and other publishers; Robert Rodale is chairman of the Rodale Research Institute and Rodale Press, Emmaus, Pennsylvania.

APPENDIX III
INTERVIEW SCHEDULES

Nepal's Vedic tradition and agricultural development

January 7, 1993

1. INTERVIEW QUESTIONS FOR PANDITS

1. How would you describe the significance of cosmic and sacred awareness in indigenous agricultural knowledge in Nepal?

How important is ritual and the spiritual consciousness of the farmer/farming community in guiding traditional farming practice?

Why is it important?

How conscious are farmers of the cosmic/sacred dimensions of their traditional practices?

2. To what extent do you identify the Vedic tradition as the origin and source of indigenous knowledge in Nepal?

3. Assuming that you believe Vedic knowledge holds relevance for Nepali development, how do you suggest this knowledge be used:

In what, if any, circumstances is it appropriate to incorporate or integrate "pieces of traditional wisdom" into an essentially external development model?

In what ways can Vedic knowledge be developed as a transforming force in defining and guiding development?

4. Can you recommend any literature for explaining to a Western reader how the universe is understood in the Vedic tradition - i.e. through processes of knowing (consciousness techniques) and how this can guide the human relationship with nature and the husbandry of natural resources.

5. Ancient Nepal enjoyed a Golden Age and, even in the recent past, times of relative food security when rice and other crops were grown by traditional methods and exported. In what respects have the recent decades of agricultural decline and food deficit been the result

of the political situation, or of some other trend? In what ways might the decline have been averted had development in Nepal more closely followed traditional, indigenous knowledge in natural resource management (agricultural, forestry, irrigation practices)?

6. *From a Vedic perspective, how do you view:*

- a) modern, "Western" cultural values of increasing consumption and economic growth.
- b) the rationality underlying Western science, the essence of which is the belief that nature can be managed and controlled by the discovery - through the analytical, reductionist scientific method - of isolated objective facts and laws?
- c) and distinguish current Western influences from previous colonialism? What effects are they having on Nepali society?
- d) the transfer of Western science and technology to Nepal, specifically modern agricultural science and technology (e.g. high yielding variety seeds, chemical fertilizers, herbicides, and pesticides)?

Vedic agricultural knowledge

7. What do Vedic texts say about:

- a) nature and natural law, or *dharma*, and the right relationship of humans with the laws of nature?
- b) 'good' and 'bad' farming practices?
- c) seasonality of operations?
- d) maintenance of soil fertility and good soil structure?
- e) control or avoidance of various weeds, pests, and diseases?
- f) the value of intercropping - mixed plant stands.
- g) integration of domestic animals, crops, trees, water, other animal, plant, or aquatic life in a symbiotic farming system?
- h) the meaning and role of farming in and for society?

i) the five elements in nature, the doshas, and other natural forces, how they interact to influence the environment for agriculture, and ways in which farmers should develop their consciousness and knowledge of these interactions so as to assure success in agriculture?

j) rituals or practical techniques for raising the consciousness of farmers and so enabling them to better adapt their practices to their natural environment?

k) the consequences of over-riding or ignoring natural signals?

6. Can you provide current examples of the practice of any of these principles and methods?

7. Please list as many examples as you know of traditional practices in agriculture and the management of natural resources (soil, water, trees of the forest), and provide in each case, where you can, a rationale for the practice that is explained by the Vedic tradition.

Examples of traditional practices might include:

- the inter-cropping of certain plant species;
- times of soil preparation, planting, weeding, and harvesting of various crops in different seasons and on different soil types or hill aspects;
- optimal uses of various soils;
- timing and amounts of irrigation water to apply;
- essential relationships among domestic animals, crops, fodder and other trees, water, and other animal, plant or aquatic life in a symbiotic farming system.

(Note: The rationale for a practice may be connected with astrology, the influence of phases of the moon, some traditionally-recognized property of underlying rock in a locality, beliefs about residing deities, or similar knowledge.)

8. An average farmer may not be aware of the original rationale for a traditional practice. The rationale may have become subsumed within 'custom' - 'the way it has always been done'.

Who in rural communities would know the original rationale behind traditional practices - what can or cannot be done during different seasons, times, or conditions in order not to upset balance in nature and to maintain ecological and social continuity?

Who are regarded as the specialists in this realm of knowledge?

9. To what extent do these specialists remain the 'opinion leaders' in rural Nepali society when decisions have to be made about farming and natural resource management practices?

10. What role do specialists in traditional knowledge continue to play in cognizing or revealing knowledge, and in sustaining and enlivening the knowledge system, in agriculture or any field in Nepal today?

11. What rituals or practices that you regard as derived from the Vedic tradition do you observe in your own farming? Please describe the rituals that you perform and explain their purpose and how they affect your farming outcomes.

12. In what ways have you ever experimented on your farm, or changed the way you do things without the advice of Agricultural Department staff? Did you experiment entirely on your own, or with the help or guidance of other farmers? Did the changes that you made solve the problems you defined?

How would you describe (or help Westerners to understand) your own state of consciousness or cosmic/sacred awareness when you experiment with or decide upon changes in traditional practice? For example, your consciousness of the force or field of natural law in your decisions, and a sacred duty to respect such forces and laws?

13. When a decision has to be made involving an innovation or a change in traditional farming practice, on what basis is the decision made?

To what extent are the cosmic and sacred aspects of the decision brought to conscious attention in decision-making?

How commonly would some ritual be performed?

What kind of rituals?

Who among the members of the extended family are involved? What traditional rituals or roles do they perform?

In what kind of decisions are pandits, priests, or *jyotish* experts involved? Can you describe the kind of rituals or consciousness-enhancing techniques these specialists would introduce to the decision-making process?

14. What traditional organizations exist in Nepali society for identifying and dealing with problems in agriculture and natural resources management (for example, users groups in irrigation)?

What roles do people whom you would describe as specialists in traditional knowledge play in these organizations?

How active are these organizations today compared with:

- the period of Panchayat rule?

- forty or fifty years ago?

What factors do you feel have led to any trend you identify in their activity?

15. What are the traditional criteria for acceptable innovations?

16. In what conditions can technology or practices introduced from an external source become part of the body of indigenous knowledge in Nepal?

17. What are the various processes and means by which indigenous knowledge (as defined here) is communicated among members of Nepali:

- families,
- communities,
- society at large,
- and across generations?

18. Do you perceive any area of conflict between traditional methods and methods of farming recommended by extension workers (JT/JTAs)?

Can you give examples of areas of conflict, e.g. in recommended crops, crop mixes, varieties, timing of operations, husbandry practices, crop-forestry-livestock interactions, labor requirements of modern varieties or agricultural 'packages'?

19. In what ways have different castes or ethnic groups innovated or changed practices differently in the agricultural/natural resources field?

Do 'higher castes' follow traditional practices more closely and adopt modern innovations more selectively than other groups? Or, are they losing traditional knowledge faster than other groups due to more aggressive or indiscriminate innovation? What is happening? And which groups are following or losing indigenous knowledge in which fields?

20. For what farming tasks do farmers still consult priests, pandits, and jyotish experts?

Does the performance of rituals vary across population groups? Which population groups still perform these rituals, and which groups do not? Does performance or non-performance of traditional observances appear to have any effect on farming outcomes?

What texts do the experts refer to? What rituals are performed?

21. Do priests, pandits, and jyotish experts have apprentices? Is their specialized knowledge being passed on adequately to the next generation?

22. Should government field staff be trained in traditional knowledge?

23. To what extent do you agree that Nepal faces a problematic population-resources-environment situation characterized by increasing human population, declining fuel, fodder, and other tree cover, declining livestock numbers, and falling manure availability, soil fertility and structure, and agricultural productivity?

Which should be the foundation for agricultural development in such a context: modern science and technology, or the indigenous knowledge of Vedic Science? What should be the role of the other?

What is the comparative "sustainability" of traditional and modern agricultural knowledge in the present problematic situation?

24. In view of the pressures and constraints on the present agricultural system, does Vedic knowledge offer any solutions to these pressures?

25. Does Vedic knowledge offer a holistic, integrated system of farming and rural development which could assure a more nutritionally and seasonally balanced food supply and secure livelihood for Nepal's present population, and, also, an approach to stabilizing the population-natural resources relationship?

26. In your view, are traditional methods and ways of farming able to sustain an adequate livelihood and a balanced, healthy food supply through each season of the year for your family?

Under what conditions can traditional methods accomplish this?

Can they accomplish this for most farmers in your area?

27. Ayurveda is capable of discerning *dosha* imbalances in an individual's mind-body state that cause seen and felt symptoms, and prescribing appropriate diets and herbal treatments to correct imbalances and maintain ideal health in each season.

Can you give examples of how this knowledge can be applied in agriculture, i.e. in guiding the selection of plants to grow, and the timing of operations through the seasons?

Just as Ayurveda is one branch of Vedic science, what possibilities do you see of other areas of Vedic knowledge being developed in the way that Ayurveda is

developed in Nepal?

28. What changes would you like to see in government policy that would lead to healthier forms of food production and diets for all Nepalis? In what ways could you influence government policies in these areas, and have you ever tried?

29. Most international scholars of indigenous knowledge study only the seen/manifest levels of indigenous knowledge systems - i.e. pieces of indigenous technology, modes of indigenous organization and communication, and forms of indigenous experimentation and innovation. They describe IK as dynamic and constantly changing, and deny the existence of any 'pure' form of indigenous knowledge because the local knowledge that outsiders see nowadays appears as a 'mix' of knowledge from many sources, and the result of continual adaptation.

What is your reaction to this characterization of indigenous knowledge?

Is there a 'pure' core of Vedic knowledge that has remained constant and unchanging over millennia? What is it? How would you describe it in terms of rules or principles, or techniques of consciousness...?

If this 'pure' core exists, how would you describe its role in maintaining or enlivening the cultural beliefs, values, and rules that underpin the indigenous knowledge system?

What is the role of Vedic knowledge, rituals, and techniques in guiding indigenous decision-making, organizing, experimentation, and innovation?

What role does this 'pure' core play in *revealing* knowledge, say, to the farmer?

What are the roles and functions of various branches of Vedic science in agriculture, e.g. jyotish, Sthapatya Ved, Gandharva Ved, etc?

Can you give examples of ways in which agricultural knowledge has evolved dynamically in response to changing historical and environmental conditions? How did the 'pure' core of Vedic knowledge ensure this responsiveness?

Modern 'scientific' observers may describe religious rituals as merely symbolic of social arrangements or of relationships between a culture and nature. Can you give examples either from historical literature or from present day phenomena that demonstrate not just symbolism but the existence of an active field or force influencing what we see?

30. What constraints does traditional agricultural knowledge based on the Vedic tradition face today?

What is the current state of practice of Vedic knowledge as applied to farming?

What has been the impact on traditional knowledge of the introduction of modern, 'Western' technologies?

What government/foreign donor policies have had the effect of weakening or destroying Vedic knowledge?

What government or donor policies have acted to promote or support Vedic knowledge?

Who is valuing and devaluing Vedic knowledge in Nepal today, and how are such decisions being made?

How can the attitudes and values of people devaluing Vedic knowledge be influenced?

What needs to be done to revitalize Vedic culture in Nepal in order to help restore Nepali society in closer harmony with nature and on a right path of development?

31. What are Nepal's Sanskrit colleges teaching? What do graduates of these colleges go and do in society?

32. What do Vedic texts say about appropriate methods of governance and decision-making in order to elevate consciousness in society and preserve cultural continuity?

33. What is the proper relationship and role of modern science in relation to Vedic science?

How, and in what conditions, should Vedic science and modern science be integrated?

When should which way of knowing be used for what?

34. In what circumstances or policy areas do you feel specialists in branches of Vedic knowledge should contribute to development?

Vedic world view

35. What is the Vedic view of, and language terms used for:

* progress, and who or what is regarded as progressive?

* backwardness?

- * societal and individual goals?
- * creativity, innovation, and change (versus continuity, stability, and balance)?
- * development?
- * sustainability of development?
- * (basic) needs of people and society?
- * poverty, powerlessness, and dependency - whether of people or a nation (causes and solutions)?
- * equity vs. inequality?
- * empowerment?
- * the role of Vedic specialists and priests in relation to individuals, communities, broader society, the state, and development?

36. If certain concepts (e.g. empowerment?) are not present in the Vedic literature, what alternative concepts appear?

* For example, instead of the political, re-distributional, 'empowering', 'targeted' anti-poverty strategies found in current development approaches (to off-set imbalances aggravated by the development process), do the Vedic texts offer alternative approaches rooted in concepts like *dharma*, coherence, consciousness, etc?

37. In the Vedic world view, what might be the vision for Nepali development and the 'unique role and contribution Nepal should have in global society and economy?

How - through what policies - is it possible for Nepal to follow her own vision and preserve her cultural integrity amid the homogenizing global influence of Western culture?

38. How do the ancient concepts of Kali Yuga and Satya Yuga aid our understanding of present trends in Nepal and the rest of the world?

How do they help explain the imbalances and instability of both means and ends that seem inherent in the 'development' process?

What hope do they offer for the future?

39. How would you rate the 'purity' and, from that, the power of the Vedic tradition in Nepal today?

Do you believe that the present level of consciousness and state of awareness of the Vedic tradition remains a powerful force or basis to use in developing a prosperous, sustainable agriculture in Nepal?

What needs to be done to revitalize the indigenous knowledge of Nepal's Vedic tradition as such a force?

40. In Sri Lanka the Sarvodaya movement attempted to renew the traditional practice of meditation in Sri Lankan society. What possibility do you see for renewing meditation practices in Nepal in order to revive the *chetana* consciousness mentioned in the ancient texts? Now that democracy has returned in Nepal, might such a revival of consciousness be easier to initiate?

2. INTERVIEW QUESTIONS FOR PRIESTS
(Priests' role in the development of agriculture in Nepal)

1. What did you study, or in what other way did you prepare, to become a priest?

What type of old texts did you study?

Were they the Vedic texts themselves, or more recent texts?

Were they based on the Vedic texts?

2. Are there references to agriculturally-related subjects -- like soil, manure, water, seed, irrigation, implements, livestock, trees -- in the texts you studied?

3. Do you routinely advise your *yajamaan* (clients) and other village neighbors on how to perform rituals in order to improve the results of their farming? If so, what type of advice do you give, and for what purposes?

4. Do you give advice for such practices as herding the cattle, raising trees, managing forests, planting crops, or harvesting and storing crops? If so, what kind of advice do you give, and at what times of year?

5. Do you advise people on astrology or any other form of prediction?

6. Are there any procedures for *grahasanti* (bringing peace, or order, to the planetary influences) to influence farming, cattle raising, or forest protection? If so, for what precise purposes are such procedures followed? By satisfying which gods or goddesses are the results of farming enhanced?

7. In many places, if rain does not fall naturally, it is the custom to invite the rain. In this regard, what have you ever studied in the texts, or what do you know from experience?

Please describe in detail any practices you know that influence rainfall, and how they are related to farming.

8. As a result of following your advice, do you recall any good or bad results your *yajamaan* and neighbors had in their farming?

Are your neighbors still practicing rituals as in the past?

What trends are taking place in the success of their farming?

9. Please explain about the significance of dark moon, full moon, first day of the month (*sangrati*), first day of the full moon, and other days which are traditionally regarded as astrologically significant. Please explain also what relation there is, if any, between these days and the state of the environment, or nature, as manifest in the earth, water, air, fauna, and flora.

10. While performing religious rituals for your clients, which gods' or goddess' devotion do you invoke for what kind of purpose?

While performing such rituals are you conscious of receiving any supernatural power?

11. In a place called Bali, Indonesia, most people are Hindus. They are farming as advised by their temple priests, and their farming system has been very productive for centuries. In Nepal what do you think needs to be done -- by society, or by the government -- to make priests as effective as in Bali? Is there any chance of enhancing priests' role and effectiveness in Nepal as in Bali?

12. If you know or practice anything else related to this subject which has not been not covered by these questions, please explain it here....

3. INTERVIEW QUESTIONS FOR AYURVEDIC PHYSICIANS
(The importance of Ayurveda in Nepal's agricultural development)

1. Does Ayurveda enter in any way into the process of agricultural development in Nepal?

Are there clauses mentioned in any of the government's agricultural planning or policy documents which show the relationship between Ayurveda and agriculture?

2. Do you think that it is true that Nepalis would be healthier if they followed the principles of diet prescribed in Ayurveda? If so, please could you explain how this would be the case.

3. How would you go about explaining to a Nepali audience -- for example, Nepali farmers and policy-makers -- how a person's health, diet, and agricultural production are related?

4. What role do you think Ayurvedic industries could have in Nepal's future economy?

5. In what context has the government mentioned policies toward Ayurveda?

To what extent do you regard those policies as promoting Ayurveda in Nepal?

6. What kind of attitudes or opinions prevail today in Nepali society with regard to studying and practicing Ayurveda in Nepal?

What kind of individuals express these opinions?

7. To what extent could Ayurveda be effective in fulfilling the health needs of Nepali people?

8. Ayurveda is a branch of Vedic knowledge. Do you have any comments or vision about the role of the Vedic tradition as a whole in Nepal's overall development?

9. In what conditions or environment would Vedic knowledge contribute to Nepal's development?

4. INTERVIEW QUESTIONS FOR ASTROLOGERS

(Astrology's contribution in Nepal's agricultural development)

1. Is there any relation between astrology and agriculture?

Can you explain or describe the way in which astrology influences farming activities, such as the time and method of planting, weeding, irrigating, harvesting, etc.

2. If you yourself are a farmer, do you follow rules of *Jyotish* in order to bring better fortune in your farming?

Do you advise your family members or other farmers about such rules?

3. Is there any reference in Astrology to the keeping of cattle, or to the kind of individuals who can successfully tame or manage different kinds of animals?

If so, are there any individuals in Nepal that you know who follow such principles? Could you describe such individuals and the principles or practices they follow?

4. What, if anything, does Astrology explain about causes of declining production and fertility of the land?

5. Are there any references in Astrology to the protection and management of natural resources? If so, please explain in detail.

6. Can you explain anything about the cause of natural disasters?

7. By performing what kind of practices can natural balance be maintained among the earth, human beings, and other creatures and plants, so that all can live on this earth without disruption?

8. Astrology is one of the branches of the Veda. What contribution do you think Astrology could play in Nepal's development?

9. It is believed in the Western world that development is based primarily on scientific research and reasoning. What effect on Nepal's development do you think there would be if Vedic knowledge were promoted and followed?

What specific suggestions do you have for changing the process of development in Nepal?

10. How do you think you could contribute to improving Nepal's development, if you were given the opportunity?

Can you describe any way in which you "see", through your *Brahma*, what a farmer should do -- such as to plant a certain variety of seed at a certain time?

Do you think that you would have anything to suggest to the Agricultural Minister that would be beneficial for farming?

Would you be ready and willing to contribute in these kinds of ways?

5. QUESTIONS TO FARMER BROTHERS AND SISTERS ON THEIR TRADITIONAL FARMING

1. While farming, do you perform any religious or social rituals?

If so, what kind of rituals, and why do you perform them?

Who suggests that you perform these rituals?

Is it your priest, or someone else?

2. Do your neighboring farming friends also perform rituals similar to yours?

3. Do you farm entirely according to tradition, or in a modern way using *bikaas* (improved) seeds and fertilizer?

4. How many times a year do you farm your land, and what do you plant each time?

5. Do you have enough to eat and for your livelihood from the harvest and income from your land?

6. Do government *J.T.A.s* (extension workers) visit your area?

If they come, what kind of advice do they give?

Do you follow their advice?

7. During which period, the old regime of *Panchayat*, or now, was the government more helpful, or its efforts more fruitful for development? Why?

8. The most fertile land of the Kathmandu valley is being sold by many farmers for building construction, and the valley's agricultural production falling as a result. Do you think that the government should do something for the benefit of farmers so that they are encouraged not to sell their land?

What do you suggest?

9. Have you ever heard Nepali *Vaidhyas* (Ayurvedic doctors) remarking that disease can be prevented if people eat food according to the season and use our own medicinal herbs?

Do you grow any kinds of crops or herbs on your farm keeping such advice in mind?
Please describe.

10. Nepal's tradition derives from the Vedic culture, during which time there was no untouchability or inegalitarian treatment of people and agriculture was reported to be very prosperous. Have you heard, or do you know, anything about this tradition? If so, what do you know?

11. In other slightly richer countries than Nepal it is being said that only if the consciousness of farmers is awakened can the country develop; so farmers are being taught to meditate and to farm more in accordance with their old traditions. To what extent do you think that this kind of approach is needed in Nepal?

12. Please, without hesitation, explain anything else that is in your mind about how to make Nepal's agriculture more productive.

Thank you.

6. INTERVIEW QUESTIONS FOR AGRICULTURAL PROFESSIONALS

1. How significant do you believe cosmic and sacred awareness is in indigenous agricultural knowledge in Nepal?

How important is ritual and the spiritual consciousness of the farmer/farming community in guiding traditional farming practice?

Why is it important?

How conscious are farmers of the cosmic/sacred dimensions of their traditional practices?

For what farming tasks do farmers still consult priests, pandits, and jyotish experts? Can you describe any rituals farmers observe and comment on their purpose?

2. To what extent do you identify the Vedic tradition as the original source of indigenous knowledge in Nepal?

3. What knowledge do you have of Vedic practices relating to agriculture?

Can you give any examples of proper applications (farming systems, practices) of Vedic wisdom in agriculture?

What is the extent of their practice by farmers?

Please list as many examples as you can of traditional practices in agriculture and the management of natural resources (soil, water, trees of the forest), and provide in each case, where you can, a rationale for the practice that is explained by the indigenous knowledge tradition (e.g. the Vedic tradition) you identified in 2. above.

Examples of traditional practices might include:

- the inter-cropping of certain plant species;
- times of soil preparation, planting, weeding, and harvesting of various crops in different seasons and on different soil types or hill aspects;
- optimal uses of various soils;
- timing and amounts of irrigation water to apply;
- essential relationships among domestic animals, crops, fodder and other trees, water, and other animal, plant or aquatic life in a symbiotic farming system.

(Note: The rationale for a practice may be connected with astrology, the influence of

phases of the moon, some traditionally-recognized property of underlying rock in a locality, beliefs about residing deities, or similar knowledge.)

4. An average farmer may not be aware of the original rationale for a traditional practice. The rationale may have become subsumed within 'custom' - 'the way it has always been done'.

Who would know the original rationale behind traditional practices - what can or cannot be done during different seasons, times, or conditions in order not to upset balance in nature and to maintain ecological and social continuity?

Who are regarded as the specialists in this realm of knowledge?

In what traditions of learning are they specialists (e.g. the Vedic tradition)?

5. To what extent do these specialists remain the 'opinion leaders' in rural Nepali society when decisions have to be made about farming and natural resource management practices?

6. What role do specialists in traditional knowledge continue to play in cognizing or revealing knowledge, and in sustaining and enlivening the knowledge system, in agriculture or any field in Nepal today?

7. When a decision has to be made involving an innovation or a change in traditional farming practice, on what basis is the decision made?

To what extent are the cosmic and sacred aspects of the decision brought to conscious attention in decision-making?

How commonly would some ritual be performed?

What kind of rituals?

Who among the members of the extended family are involved? What traditional rituals or roles do they perform?

In what kind of decisions are pandits, priests, or *jyotish* experts involved? Can you describe the kind of rituals or consciousness-enhancing techniques each of these kind of specialists introduces to the decision-making process?

8. What rituals or practices that you regard as traditional do you observe in your own farming?

How would you describe (or help others to understand) your own state of consciousness or cosmic/sacred awareness when you experiment with or decide upon changes in traditional practice? To what extent are you conscious of the force or field

of natural law in your decisions, and a sacred duty to respect such forces and laws?

9. What traditional organizations exist in Nepali society for identifying and dealing with problems in agriculture and natural resources management (for example, users groups in irrigation)?

How active are they?

What roles do people whom you would describe as specialists in traditional knowledge play in these organizations?

10. In what ways do farmers experiment on their own farms, or change the way they do things without the advice of professional researchers and extension staff? Who (e.g. pandits, priests, jyotish experts) are consulted? Are farmers' own experiments and innovations effective?

11. What are the traditional criteria for acceptable innovations?

12. In your view, are traditional methods and ways of farming able to sustain an adequate livelihood and a balanced, healthy food supply through each season of the year for farm families?

Under what conditions can traditional methods accomplish this?

13. Can you think of examples of the extent to which Ayurvedic principles and practices can contribute to assuring Nepali families of a balanced, healthy diet through all the seasons of the year? What applications do you think Ayurveda has in agricultural development programs?

14. The holistic approach of Ayurveda is capable of discerning *dosha* imbalances in an individual's mind-body state, and prescribing appropriate diets and herbal treatments to correct imbalances and maintain ideal health in each season.

Can you give examples of how this knowledge can be applied in agriculture, i.e. in guiding the selection of plants to grow, and the timing of operations through the seasons?

15. Nepal has had some experience with "Farming Systems Research and Extension" and "participatory rural appraisal". It has been noted generally that FSR-E can be implemented in either of two ways, that is, as "technology push" or "farmers' needs pull". The technology push mode arises from the desire of technology innovators (ag. professionals) to see how well their innovations are adopted by farmers in the field. The starting point of the farmers' needs pull approach is not new technology but the analysis of existing farming systems, in situ, to determine needs, problems, and constraints to which subsequent technological innovation is directed. How would you characterize Nepal's mode of FSR-E to date? Can you provide any

data, reports etc. which provide illustrations of this experience?

16. Do you perceive any areas of conflict between traditional methods and methods of farming recommended by research-extension?

Can you give examples of areas of conflict, e.g. in recommended crops, crop mixes, varieties, timing of operations, husbandry practices, crop-forestry-livestock interactions, labor requirements of modern varieties or agricultural 'packages'?

17. In what ways have different castes or ethnic groups innovated or changed practices differently in the agricultural/natural resources field?

Do 'higher castes' follow traditional practices more closely and adopt modern innovations more selectively than other groups? Or, are they losing traditional knowledge faster than other groups due to more aggressive or indiscriminate innovation? What is happening? And which groups are following or losing indigenous knowledge in which fields?

18. Ancient Nepal enjoyed a Golden Age and, even in the recent past, times of relative food security when rice and other crops were grown by traditional methods and exported. In what respects have the recent decades of agricultural decline and food deficit been the result of the political situation, or of some other trend? In what ways might the decline have been averted had development in Nepal more closely followed traditional, indigenous knowledge in natural resource management (agricultural, forestry, irrigation practices)?

19. To what extent do you agree that Nepal faces a problematic population-resources-environment situation characterized by increasing human population, declining fuel, fodder, and other tree cover, declining livestock numbers, and falling manure availability, soil fertility and structure, and agricultural productivity?

Which should be the foundation for agricultural development in such a context: modern science and technology, or indigenous knowledge?

What is the comparative "sustainability" of traditional and modern agricultural knowledge in the present problematic situation?

20. What do you think would be the Vedic perspective on:

a) the rationality underlying Western science, the essence of which is the belief that nature can be managed and controlled by the discovery - through the analytical, reductionist scientific method - of isolated objective facts and laws?

b) the transfer of Western science and technology to Nepal, specifically modern

agricultural science and technology (e.g. high yielding variety seeds, chemical fertilizers, herbicides, and pesticides)? What kind of foreign technologies are appropriate in Nepali conditions, and which are inappropriate?

c) the latest developments in modern science - e.g. biotechnology?

d) recent trends in agricultural practices - e.g. crops introduced, changes in cropping patterns, farming systems, seasonal production, and farming methods?

e) recent trends in agriculture and the environment, i.e. the 'problematic situation' mentioned in question # 19 above?

21. In view of the pressures and constraints on the present agricultural system, does indigenous knowledge offer any solutions to these pressures?

22. How do you think that the Vedic tradition might offer a holistic, integrated system of farming and rural development which could assure a more nutritionally and seasonally balanced food supply and secure livelihood for Nepal's present population, and, also, an approach to stabilizing the population-natural resources relationship?

23. Consider the present structure and functioning of HMG agricultural infrastructure of research and production farms, AIC godowns, cooperative stores, fertilizer credits, the banking sector, and the extension system. Please explain the extent to which you consider the current pattern of government investment in agriculture to be appropriately balanced as between the development of indigenous knowledge and the transfer of "Green Revolution" technologies?

24. What potential dangers (e.g. to the economy, society, the environment, human health) accompany the promotion of Green Revolution technologies in the Nepali farming context? Of what relevance to Nepal are current Western concerns about monocropping, soil loss, soil and water pollution, food contamination, shrinkage of rural communities, and the high energy costs of the modern, high-external-input agricultural system?

In what ways should knowledge of these "sustainability" problems in any way affect Nepali agricultural policy-making?

25. What pressures (internal and external) tend to determine the government's adoption of Green Revolution production-program strategies in Nepal? Is their wholesale adoption inevitable, or can you see alternatives?

26. In what ways do you think the growth of modern professional attitudes and values affects the development of indigenous knowledge in Nepal?

27. Should extension staff be trained in traditional knowledge?
28. In what ways do any external (international) political, economic, or other pressures act to prevent or discourage the application of indigenous knowledge in Nepal? If such pressures exist, what is their source or motivation?
29. What do you believe is the attitude of Nepali farmers to such external influences?

What policies or mechanisms exist now for offering Nepali farmers choices between modern and traditional options?
30. If you believe indigenous knowledge holds relevance for Nepali development, in what circumstances is it appropriate to incorporate or integrate "pieces of traditional wisdom" into an essentially external development model? Or is it inconsistent to reduce indigenous knowledge into 'pieces'?
31. How would you rate the 'purity' and, from that, the power of the Vedic tradition in Nepal today as the basis for developing a prosperous, sustainable agriculture in Nepal?

What needs to be done to revitalize the indigenous knowledge of Nepal's Vedic tradition as a transforming force in development?
32. In Sri Lanka the Sarvodaya movement attempted to renew the traditional practice of meditation in Sri Lankan society. How would you react to renewing meditation practices in Nepal in order to revive the *chetana* consciousness mentioned in the ancient texts?

APPENDIX IV
COVER LETTER

***CENTER FOR INDIGENOUS KNOWLEDGE
IN AGRICULTURE AND RURAL DEVELOPMENT (CIKARD)
and the DEPARTMENT OF AGRICULTURAL EDUCATION
IOWA STATE UNIVERSITY***

422 Ash Avenue, Ames, Iowa 50010, USA.

January 8, 1993

Dear

Research study: Sacred tradition and knowledge indigenous to Nepal and its role in agricultural development

I am writing to request your kind help with this research study.

It may come as a surprise to see a former expatriate 'agricultural adviser' in Nepal now researching into sacred tradition. My transformation came about as a result of marrying into a Nepali family with a well-established tradition in Vedic scholarship and Ayurvedic practice. As a result, I feel that researching in this field will help to prepare me both to understand the ancient roots of Nepali culture, and to examine the basis for a truly sustainable agriculture in Nepal.

The subject of this research is 'indigenous knowledge' (IK). IK is currently being 're-discovered' by development professionals who question the true economic efficiency, and ecological and social sustainability of modern food and agricultural systems. These have been found to be highly energy consuming, dependent on external inputs, destructive of soils, and toxic to the environment. And they produce food of questionable purity and safety, and disturb the structure of traditional rural communities. As a result, consensus is growing in the West for an alternative, sustainable agriculture - a new agricultural 'paradigm'. The quest for an alternative paradigm is part of a broader critique of development. Dominated by modern science and technology and materialist 'Western' cultural values, it is argued that 'development' has devalued and even destroyed other cultures' value systems and ways of knowing and understanding the world.

The issue that I see in the renewal of interest in IK is whether it becomes merely the latest in a long line of 'revisions' in development that attempt to make development more equitable, participatory, or sustainable (but do not challenge the fundamental hegemony in development of 'Western' culture) or whether it transforms development by re-introducing the values and world views belonging to cultures which have maintained traditions that show greater respect to nature.

Which of these alternative roles IK will play will depend on how it is defined and used in development. As I look at it:

Indigenous knowledge is a sacred cosmology and its expression as a unique and constantly evolving body of facts and learning about the relationship between humankind and nature - the life-world knowledge - of a culture or society that maintains a live-tradition of cosmic and sacred awareness.

The essential objective of this research is to gather evidence for the role of sacred cosmology and ritual as the inseparable and underlying foundation for indigenous agricultural knowledge in Nepal, and to describe the history and salient features of this tradition. The original sacred tradition and system of science in Nepal is the Vedic tradition - a tradition which goes back several thousand years and which has been followed with varying degrees of consciousness since the early Vedic period.

Although 'Vedic' in the original purity of the tradition refers to this era, the purpose of this research is not to suggest a literal leap back in time to the early Vedic period, neither are my questions limited to knowledge of the tradition of that time. The expectation is that, in your responses, you may raise as much as you believe, know, or have heard about relating to the tradition and the extent to which you consider it the basis of farmers' indigenous knowledge in Nepal. You may be able to think of certain more recent periods during which time Nepal's environment and economy flourished, social harmony prevailed, and there was no political polarization. It would be of interest to incorporate knowledge of the traditions of those periods also. Broader still, the knowledge system of any indigenous group in Nepal - whether Bhote, Brahmin, or Sarki - is of interest if it illustrates in the present or the past the kind of harmony with nature that was structured in the *chetana* consciousness that is mentioned in the ancient texts.

Some recent experience in Bali, Indonesia may interest you. Two researchers found that this Hindu island's ancient and highly complex irrigated farming system is coordinated in such a way as to perfectly distribute water supplies through multiple rivers, channels, and tunnels, down the terraced mountainsides. The incidence of crop pests is minimized, while soil fertility and total productivity of the terraces is optimized. Neither the Asian Development Bank nor the Indonesian government, which together had embarked on a multi-million dollar 'Green Revolution' modernization program, were aware that the whole irrigation system was coordinated by a network of Hindu 'water temples'. No irrigation engineers, but priests communing with a goddess achieved this system which was perfectly in tune with nature. After the researchers' computer model showed how optimal the indigenous system was, the ADB-financed project was scrapped.

Perhaps Nepal's new democracy may provide the political environment for studying how to apply the indigenous knowledge tradition of Nepal to modern challenges. At CIKARD and the Department of Agricultural Education we would be interested in your views on whether the knowledge of indigenous knowledge can be usefully incorporated in national

policy today. We will be indeed grateful for the time you can give to this inquiry.

I anticipate that my interviews will last between one and two hours. I hope that you may feel that the subject merits this amount of attention, and that, should you be able to spare this amount of time, you will find the discussion thought-provoking and worthy of the investment of your precious time. Naturally, your participation is entirely voluntary. You will also have every opportunity during the interview to request that confidentiality be observed with respect to any specific response you give, or with respect to the entire interview.

My research assistants, Kabita Bhattarai and Sanjaya Dhakal, will be contacting you shortly to set up interviews. I look forward very much to your response.

Sincerely and gratefully,
Anthony Willett